

United States Department of Interior
Bureau of Land Management
Buffalo Field Office

Burnt Hollow Management Plan
Pre-Decisional Environmental Assessment
(WY-070-03-199)



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This environmental assessment (EA) analyzes environmental consequences of the proposed Burnt Hollow Management Plan and alternative management programs. The EA will also identify appropriate measures to mitigate environmental effects, and document the decision-making process. Some of the proposed actions require development of detailed project plans prior to their implementation. Additional site-specific environmental analyses will be prepared for these project plans prior to implementation in order to comply with the requirements of the National Environmental Policy Act.

CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

In a land exchange completed in March 2002 the Bureau of Land Management (BLM) Buffalo Field Office (BFO) acquired 9,236 acres of land. The acquired lands are contiguous to 9,180 acres of previously inaccessible BLM and State of Wyoming lands, totaling about 18,416 acres of public land, in one accessible block (Figure 1.1). This block is located in Campbell County, north of Gillette. Wyoming Highway 59 borders the property on the west and the Cow Creek County Road borders the north end of the property. The area is being termed the Burnt Hollow Management Area (BHMA).

The BHMA boundary as drawn in Figure 1.1 includes private and state lands; this management plan does not apply to non BLM managed lands. A second land exchange, to obtain approximately 560 acres of private property within the boundary, is in progress. The property proposed for acquisition is included in this management plan; this management plan will also apply to any future properties acquired by BLM within or adjacent to the BHMA.

To promote ecological and natural integrity, BLM prefers to manage similar, contiguous land areas (i.e. watersheds) as single units. Therefore, although the land exchange involved primarily one grazing lessee within one allotment (60 Bar), the BHMA contains portions of several BLM allotments. In respect to the other grazing lessees, proposed trailheads and other facilities remain to the extent practical within the boundaries of the 60 Bar allotment. Grazing management as discussed in this document, pertains only to the 60 Bar allotment. For the other grazing allotments, compatibility with the Burnt Hollow Management Plan shall be one of the factors analyzed during lease renewal.

The lands and realty management objective stated in the BFO Resources Management Plan (RMP) (BLM 2001) is to:

“Avoid the potential of inadvertent trespass by people accessing the public lands, and to improve access and manageability of the public lands.”

Priority for lands to be acquired is given to those lands that can provide access to large blocks of public lands or to public land with unique resources. Lands with high scenic value, or contain

Figure 1.1 Existing and Acquired Public Lands Comprising the Burnt Hollow Management Area, Campbell County, Wyoming.



water, or those that provide wildlife habitat are desirable. Blocked land and access is also desirable if accessible to communities such as Gillette.

The acquired lands meet all these criteria. As stated above the exchange provides public access to a block of approximately 18,416 acres. The varied topography and diversity of vegetation communities is unique and provide habitat for numerous wildlife species including trophy class mule deer (*Odocoileus hemionus*). A few of the ephemeral drainages support ecologically important cottonwood (*Populus* spp.) riparian communities. Finally, the area is accessible to Gillette, 16 miles to the south on Wyoming Highway 59.

To protect these resources and fulfill the lands and realty management objective, a management plan needs be prepared for the acquired lands and the previously inaccessible BLM lands. This Environmental Assessment will identify the issues previously raised by the public, describe the proposed management plan, describe alternatives to the proposed management plan, describe the environmental resources affected, and disclose the effects of the proposed management on the environmental resources.

1.1 Conformance with Land Use Plan

Development of a resources management plan for public lands is subject to and consistent with the Buffalo Field Office Resources Management Plan (BLM 2001). Conformance with the RMP's land and realty management objective was discussed above.

1.2 Relationship to Statutes, Regulations, or Other Plans

This environmental assessment was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) and other statutes relevant to the proposal.

Authority for the proposed action and alternatives is contained in the Federal Land Policy and Management Act of 1976, as amended (FLPMA) and the regulations in 43 CFR 2200. Section 102(a)(8) of FLPMA states:

“the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use;”

1.3 Permits, licenses, and other entitlements necessary for implementation

Many of the projects proposed in this management plan will require permits, licenses, or other entitlements. All necessary documents will be acquired before a project is implemented.

CHAPTER 2. ISSUE IDENTIFICATION AND ALTERNATIVE DEVELOPMENT

2.1 Public Participation

Area media announced the land exchange and a series of public meetings in February 1998. The press release specifically encouraged public involvement in the land exchange process. Three public meetings were held in Buffalo, Gillette, and Sheridan. Sixty people attended the three meetings, and nineteen comments were received. Regional newspapers and radio stations carried stories following the public meetings. Following the public meetings and media coverage, six letters providing comments on the land exchange were received. Many of the comments received related to management of the acquired lands after completing the exchange, the issues identified during the land exchange process were used to define the scope of this management plan. The management related comments identified 24 issues relating to six key issues.

Key Issues and their Management Issues

Increasing recreation levels

- Limit numbers of users - Recreational uses may be heavy at times; may need to consider and possibly dictate numbers and uses.
- Conflicts between uses – recreation impacts on other resources, hunters vs. livestock grazing, etc.
- Sign boundaries – This land must be signed to not have trespass conflicts with bordering landowners.

Enforcement

- Users need to police themselves – Users need to share in the responsibility of management, and police themselves.
- BLM law enforcement presence is limited, formal law enforcement necessary – i.e. volunteer host, cooperative agreement with Campbell County Sheriff, increased presence of BLM ranger.

Open space

- Maintain traditional uses (livestock grazing, hunting, mineral development) – we should strive to maintain open space and traditional uses.
- Recreation vs. agriculture – concerns over changing open space, recreation vs. agriculture.
- Maintain current lessee – current lessee should be able to continue grazing lease.
- Special management area – i.e. Area of Critical Environmental Concern (ACEC)

Motorized vehicles

- Roads – Comments ranged from no roads to a road network is necessary, most comments considered road access necessary but should be limited and that the public should be involved with planning.
- Vehicle types – Vehicles damage the resources, damages often related to vehicle type (i.e. ATV, snowmobile, truck), including no vehicles.
- Access for people with disabilities – Vehicle access for the physically handicapped should be considered.

Best use of the property

- Board to oversee management – Several comments were received that a board or Coordinated Resource Management (CRM) team to develop a management plan and manage the lands was the best course.
- Access – Public access to the lands is necessary but it also needs to be limited and controlled. Concern was also expressed that access would be closed off.
- Multiple uses – Multiple uses must be considered: community, agriculture, recreation, timber, minerals, wildlife, etc.
- Water development – Should plan for water developments and how they will be used.

Education

- Outdoor classroom – Lands should be used as an outdoor classroom for students and private groups.
- Involve students – Should involve the schools and include the students in planning and management.

2.2 Coordinated Resources Management Team

Recognizing the unique character of the area, a Coordinated Resources Management (CRM) team was established to prepare a proposed management plan for the BLM BFO. The team's purpose was, and continues to be, to propose management strategies to maintain quality land stewardship. The CRM team was composed of representatives from the grazing lessees (previous landowners), Campbell County Conservation District, the University of Wyoming Cooperative Extension, Wyoming Game and Fish Department, Campbell County School District, local business, special interest groups, adjoining landowners, and the BLM. The CRM team was further divided into four Technical Resource Teams (TRT) for education, grazing, recreation, and wildlife. The resource teams included CRM team members and additional individuals with interest or knowledge in the specific resource. BLM specialists acted as advisors, advising on BLM policy and procedures without undue influence on the TRT and CRM teams developing the proposed management plan.

Respect for adjoining landowners was a primary concern of the CRM team. Members of the CRM team desired to propose management only for the exchanged lands. BLM preferring to manage public lands as a natural ecological unit included all contiguous BLM managed lands within the BHMA.

The CRM team developed a goal for managing the area, identified the resources that might be affected by management, developed goals for managing the resources, and identified action items to meet the management goals. The affected resources identified were livestock grazing, minerals, recreation including public education, and wildlife. The overall goal for the Management Area is:

To maintain an enhanced system to provide sustainable viability of the resources for future generations with respect for values, rights, and quality of life of surrounding land owners and other users.

The CRM team's vision is to maintain the relatively pristine character of the land and provide for near-wilderness experiences. Sweeping vistas, pine covered hills, and rugged terrain offer abundant opportunities for hiking, horseback riding, wildlife viewing, hunting, and solitude. But for all its ruggedness, the BHMA is also fragile; the area contains steep slopes and erosive soils. Unmanaged, the CRM team believes erosion would increase, available forage and wildlife habitat would decrease, and user conflicts would escalate. The team firmly believes the land should be used, that livestock grazing, educational activities, and recreation can coexist. And by retaining the primitive, semi-wilderness, character, the BHMA can compliment the more developed areas in the nearby Thunder Basin National Grasslands and Weston Hills Recreation Area.

Aspects of vegetation management were included in the CRM proposal as they relate to livestock grazing, recreation, and wildlife habitat. BLM resource specialists believe vegetation is an important resource and would be best discussed and analyzed as a stand-alone resource, than within several other resource categories. The CRM proposed actions for vegetation management were taken from the various resource categories and grouped together into a vegetation management resource.

2.3 Alternatives by resource

The individual resources were not combined together into complex interdisciplinary alternatives, but instead within each resource area a range of possible actions (alternatives) will be discussed. The BLM interdisciplinary team preparing this draft management plan believes this method will be less confusing to the readers than complex interdisciplinary alternatives.

Alternative 1 is the no action alternative, required as a baseline measure by the National Environmental Policy Act. Current management would continue as directed by existing planning and management documents such as the Approved Resource Management Plan for Public Lands Administered by the BLM Buffalo Field Office (BLM 2001).

Alternative 2 is the CRM team's proposed management plan, it describes the Burnt Hollow Management Plan as proposed by the CRM team. The proposed management actions are intended to meet the goals and objectives identified by the CRM team.

NEPA directs agencies to rigorously explore and objectively evaluate all reasonable alternatives (CEQ 1986). BLM specialists developed additional alternatives to represent a reasonable range. Some resources may have more alternatives than others as the range of reasonable alternatives was greater. For example the recreation management emphasis could range from non-motorized recreation with primitive or no facilities to motorized recreation with developed recreation facilities, while range management has a narrower range of reasonable alternatives. BLM

specialists prepared the additional alternatives to resolve the key issues identified by the public, CRM team, and BLM specialists.

This draft management plan contains both management concepts and specific projects. The management concepts and some of the proposed projects require further refining prior to implementation. Additional site-specific environmental analyses will be prepared for these project plans prior to implementation in order to comply with the requirements of the NEPA. Where the detail is sufficient, this EA will serve as the NEPA compliance.

When reviewing and commenting on this EA it is important to review the components of each alternative and provide constructive comments. Please identify the resource and alternative component being commented upon. For analysis purposes, the components of each alternative are static; however, the final management plan may, and is expected to, use components from any of the alternatives or that arise from comments on this pre-decisional EA.

Table 2.1. Summary of Alternatives for the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Livestock Grazing	Livestock grazing would continue in accordance with current leases.	Deferred grazing schedule and range improvements to manage for sustainable, healthy, and diverse vegetation communities.	No livestock grazing	
Minerals	Mineral development is consistent with the 2001 Approved Resource Management Plan for the BLM Buffalo Field Office.	Manage mineral development in a manner that considers aesthetics and is compatible with other uses and the geological base.	Mineral development would be guided by a Burnt Hollow Mineral Management Plan	
Recreation	Recreation use is consistent with the 2001 Approved Resource Management Plan for the BLM Buffalo Field Office.	Non-motorized. Recreation use is compatible with other resources, considers aesthetics, and respects the unique qualities of the land.	Semi-motorized. Manage recreational opportunities for all users that are compatible with other resources, respects the unique qualities of the land, and provides educational opportunities.	Developed Motorized. Provide developed and motorized recreation opportunities that consider other resources, respect the land, and provide educational opportunities.

Table 2.1 (continued). Summary of Alternatives for the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Sign Program	None	Post boundaries. Provide educational pamphlets.	Post boundaries. Provide educational pamphlets.	Post boundaries. Provide educational pamphlets.
Trailheads	None	Two adjacent to WY 59. Windmill Cedar Draw	Three with short access roads. Windmill Cedar Draw School Section	Three with short access roads. Windmill Cedar Draw School Section
Roads and Trails	Existing roads and trails available for motorized use. No seasonal restriction.	Limited motorized vehicle use (emergencies and limited administrative purposes).	Seasonal motorized vehicle use on existing roads.	Existing roads and trails available for motorized use. No seasonal restriction.
Monitoring	As resources are available.	Recreation use monitored.	Recreation use monitored.	Recreation use monitored.
Law Enforcement	Occasional patrols by BLM ranger.	Cooperative agreement with Campbell County Sheriff. Volunteer manager.	Cooperative agreement with Campbell County Sheriff. Volunteer manager.	Cooperative agreement with Campbell County Sheriff. Volunteer manager.
Education	No developed facilities.	Developed facility.	Developed facility.	Developed facility.
Special Recreation Permits	Available.	Available. Commercial permit area relates to livestock allotments.	Available. Commercial permit area relates to livestock allotments.	Available. Commercial permit area relates to livestock allotments.
Firearm Discharge	Wyoming regulations.	Prohibited except for hunting.	Prohibited except for hunting.	Wyoming regulations.

Table 2.1 (continued). Summary of Alternatives for the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Special Management Area	Special management area designation not pursued.	Special management area designation not pursued.	ACEC characteristics are maintained.	Special management area designation not pursued.
Developed camping	None.	None.	Developed dispersed sites along Cedar Draw Road.	Traditional developed campground, family sites and a group site. Location to be determined.
OHV Trail	No new OHV trails.	No OHV use except for emergencies and administrative purposes.	No new OHV trails.	Loop trail to be developed with trailhead off Cow Creek County Road.
Vegetation	Vegetation management is consistent with the 2001 RMP and the 2002 Vegetation Management EA.	Vegetation communities are maintained within their natural range of composition and structure, management is compatible with other resources and is consistent with the 2002 Vegetation Management EA.	Natural processes – no vegetation management would be proposed, natural fires within prescription shall be allowed to burn.	
Forest communities	Management activities consistent with 2002 Vegetation Management EA.	Forest communities maintained within their natural range of variability, enhance habitat and forage.	Natural processes shall be allowed to proceed without intervention.	

Table 2.1 (continued). Summary of Alternatives for the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Shrubland communities	Management activities consistent with 2002 Vegetation Management EA.	Shrubland communities maintained within their natural range of variability, enhance habitat and forage.	Natural processes shall be allowed to proceed without intervention.	
Riparian Communities	Management activities consistent with 2002 Vegetation Management EA.	Riparian communities maintained within their natural range of variability, enhance habitat and forage.	Natural processes shall be allowed to proceed without intervention.	
Invasive Weeds	Management activities consistent with 2002 Vegetation Management EA.	Certified weed free hay required. Management activities designed to prevent infestation. Weed management plan	Same as Alternative 2.	
Wildland Fire	All wildland fires suppressed. Campbell County responsible for initial attack, consult with BLM if the fire escapes initial attack suppression efforts. Few restrictions on suppression tactics or heavy equipment use.	Fire management plan emphasizing fire's ecological role and providing for wildland fire for resource use. BLM management of fires that escape initial attack, and restricted use of heavy equipment.	Fire management plan emphasizing minimal surface disturbance during suppression. Heavy equipment authorized only for protection of human life.	

Table 2.1 (continued). Summary of Alternatives for the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Wildlife	Vegetative treatments to improve wildlife habitat quality and forage production consistent with 2002 Vegetation Management EA.	Manage for diverse and healthy populations of fish and wildlife.	Manage to improve biological diversity, support WGFD objectives, improve forage and habitat quality, and provide habitat for special status species.	
Habitat Management	Consistent with 2002 Vegetation Management EA.	Provide adequate habitat to provide sustainable well distributed populations	Active program to enhance habitat quality and increase biodiversity.	
Hunting	Consistent with WGFD regulations.	Consistent with WGFD regulations. Semi-primitive (non-motorized) experience.	Consistent with WGFD regulations and Burnt Hollow Management Plan.	
Mule Deer	No special emphasis.	Management actions designed to benefit mule deer.	Single species management not emphasized.	
Population Inventory	As resources are available.	Monitoring program to enable adaptive management.	Monitoring program to enable adaptive management.	
Predator Management	Consistent with BLM's Approved RMP.	Consistent with BLM's Approved RMP. Recreational predator hunters may be directed to BHMA.	Consistent with BLM's Approved RMP.	
Range Improvement	Would consider wildlife.	Designed to benefit or be compatible with wildlife.	Designed to benefit or be compatible with wildlife.	

Table 2.1 (continued). Summary of Alternatives for the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Species Diversity	Maintenance of diversity provided for by other action items.	Diversity shall be enhanced through other action items.	Diversity shall be enhanced through other action items.	
Waterfowl	No special emphasis	Foraging and nesting habitat enhancements shall be identified. Livestock water developments would be designed to enhance waterfowl habitat.	Potential habitat enhancement locations identified, other locations would be considered. Livestock water developments would be designed to enhance waterfowl habitat.	

2.4 Livestock Grazing

Grazing management as discussed in this document, pertains only to the 60 Bar allotment. For other allotments within the BHMA, compatibility with the Burnt Hollow Management Plan shall be one of the factors analyzed during lease renewal.

As defined in 43 CFR (Code of Federal Regulations) Subchapter D, Section 4100.0-5 Definitions:

Allotment means an area of land designated and managed for grazing of livestock.

Grazing Lease means a document authorizing use of public lands outside of an established Grazing District. Grazing leases specify all authorized use including livestock grazing, suspended use, and conservation use. Leases specify the total number of AUMs apportioned and the area authorized for grazing use.

Alternative 1 (No Action)

Livestock grazing would continue to be managed under the current grazing lease. The BHMA lies mostly within the 60 Bar Ranch Allotment, 2400 animal unit months (AUM) are authorized with a variable season of use. The grazing permit shall remain with the current lessee in accordance with the current terms and conditions. The allotment is divided by fences and topography into three pastures. Future range improvements would be considered and analyzed in separate environmental analysis documents.

Alternative 2 (Proposed Action)

The proposed goals for livestock grazing are as follows:

1. Manage or create healthy and diverse vegetation communities that are compatible to the area to maintain and improve the forage base for all grazers.
2. Manage to enhance a sustainable ranching operation for present and future generations.

The 60 Bar Allotment shall be managed to ensure the CRM team's goals are met. Other allotments containing public lands within the BHMA shall continue to operate under their current leases. At lease renewal, compatibility with the Burnt Hollow management plan shall be one of the factors analyzed.

Action items to accomplish the goals are as follows:

1. Implement a deferred grazing management schedule. Grazing will rotate between each pasture throughout the year. Which ever pasture was grazed early in the growing season one year, will be grazed either in the summer or fall/winter the next two years. All pastures will be given some rest during the growing season April – June. A typical grazing schedule would be as follows:

	Late Winter / Early Spring	Spring/Summer	Fall / Early winter
First year	Big Pasture	Cow Creek Meadows	Burnt Hollow
Second year	Cow Creek Meadows	Burnt Hollow	Big Pasture
Third Year	Burnt Hollow	Big Pasture	Cow Creek Meadows

As additional pastures are developed the season of use and length of use in each pasture can be modified to give each pasture more rest during the peak growing season.

2. Livestock use in the Cow Creek Meadows pasture will be closely monitored.
3. Improvement of water developments would include, but are not limited to; repair reservoir spillways at Lower Cedar Draw Reservoir, Bob Reservoir, and L Draw Reservoir; refurbish springs with new tank, pipe, and fabric at Lower Cedar Draw and Upper Cedar Draw. Convert the windmill in section 33 (Township 53 North Range 71 West) to solar power, water would also be made available for recreational stock.
4. Fence Cedar Draw from remainder of Big Pasture to enhance pasture rotation, while allowing for livestock and wildlife use;
5. Gap fence to create a new pasture (the Flats) in the northwest corner of the Big Pasture;
6. Control channel erosion in Cow Creek, Cedar Draw, and Provant Creek drainages. This would include construction of several small reservoirs within tributaries to reduce water velocity and volume within the main channel during storm events;
7. Reduce juniper cover by prescribed fire or other fuel reduction program;
8. The grazing permit shall remain with the current lessee in accordance with the current term.

Alternative 3 (No grazing)

This alternative would not allow livestock grazing within the BHMA, it conflicts with the Approved Resource Management Plan (BLM 2001) and the key issues. The livestock grazing management objective as stated in the RMP is to “maintain or improve forage and range condition to provide a sustainable resource base for livestock grazing on the public lands while improving wildlife habitat and watershed.” Issues raised by the public were to maintain traditional uses, such as livestock grazing, and for the current lessee to be able to maintain the lease. Under this alternative, BLM and/or the adjoining landowner would need to construct approximately 6 miles of fence to prevent livestock use of the public lands. The BLM would spend approximately about one work month per year to inspect the allotment and enforce the grazing closure.

2.5 Minerals

Alternative 1 (No Action)

BLM's management objective, as stated in the 2001 Approved Resource Management Plan (BLM 2001), is to maintain or enhance opportunities for mineral exploration and development while maintaining other resource values. Mineral development proposals shall be evaluated when received, other resource values shall be considered and maintained.

Alternative 2 (Proposed Action)

Mineral development will be managed in a manner that considers aesthetics and is compatible with other uses and the geological base. Mineral development proposals shall be evaluated when received; aesthetics and other resource values shall be considered and maintained.

Alternative 3 (Mineral Management Plan)

A minerals management plan will be developed to ensure all resource values (aesthetics, recreation, wildlife, etc.) and management direction identified within the Burnt Hollow Management Plan are protected. This alternative would not obstruct mineral development, but would direct development and protect other resources. Development proposals shall conform to the Burnt Hollow Minerals Management Plan.

Alternatives Considered but Eliminated from Further Consideration

Mineral Development Prohibited: Development of the federal mineral estate within the BHMA would be prohibited; state and private mineral development could continue. The Approved Resources Management Plan for the Public Lands Administered by the BLM Buffalo Field Office (BLM 2001) has previously made the decision to continue to lease and allow development of federal oil and gas; there are several active federal mineral leases within the BHMA. The BLM's authority to preclude development is limited, an oil and gas lease grants the lessee the "right and privilege to drill for, mine, extract, remove, and dispose of oil and gas deposits" in the leased lands (BLM 2003).

2.6 Recreation & Education

Alternative 1 (No Action)

The BHMA would be available for recreation use, no facilities would be developed, and the prohibition on motor vehicles would be allowed to expire in November 2003. Motor vehicles would be limited to existing roads and vehicle routes. The BLM would not implement the proposed Burnt Hollow Management Plan; issues identified by the public, CRM, and BLM resource specialists would remain unresolved.

Alternative 2 (Proposed Action- Non motorized)

Recreation would be managed as proposed by the CRM team. Recreation goals are as follows:

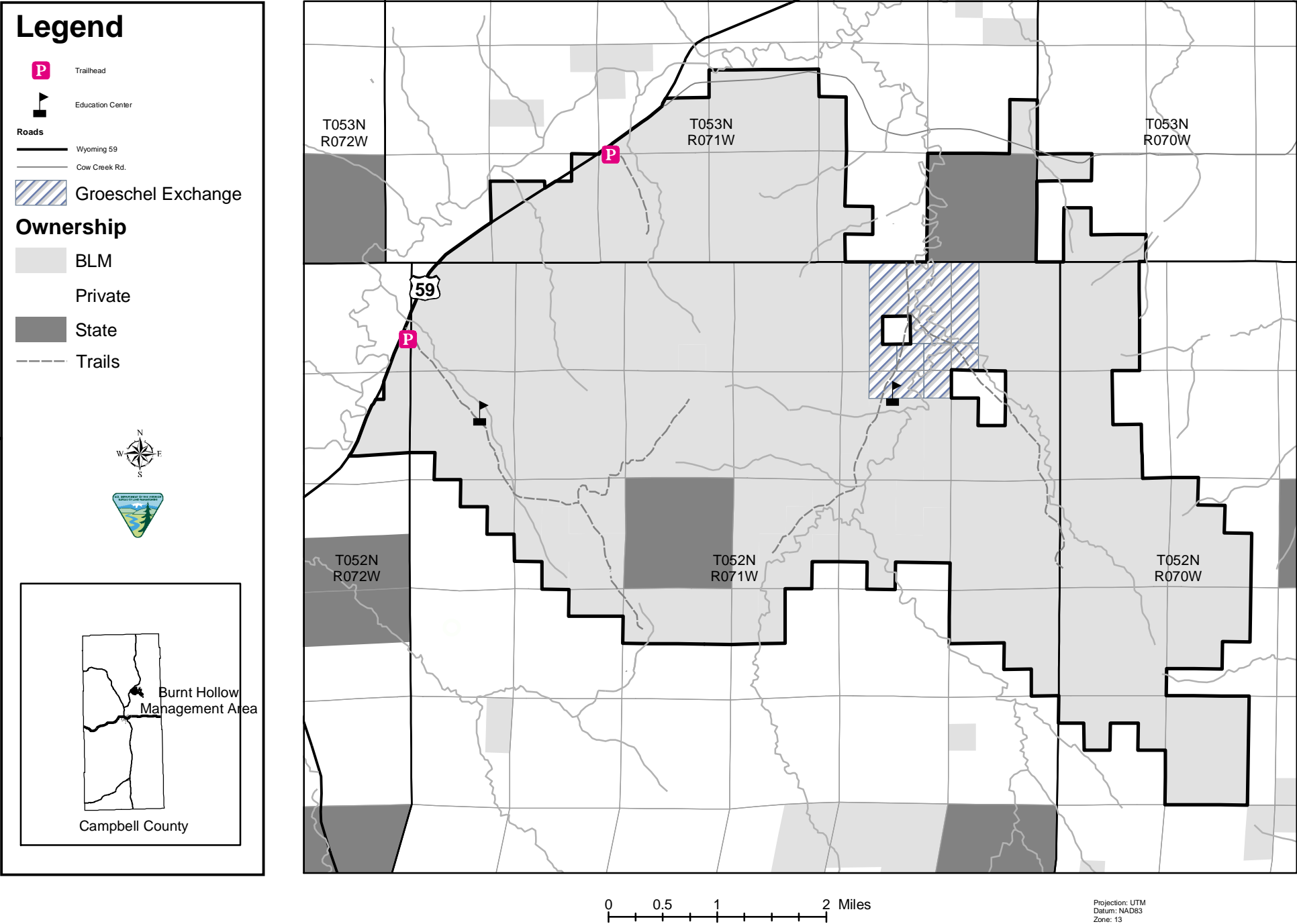
1. Create and manage recreational opportunities that are compatible with other

- resources, consider aesthetics, and respect the unique qualities of the land.
2. Protect the resources, land, and adjacent landowners.
 3. Develop educational opportunities for all users.

The following action items have been identified to accomplish the goals:

1. Sign Program: A sign program shall be implemented to inform and educate the public. The southern boundary would be posted from Wyoming Highway 59 possibly extending to the jeep trail along the ridge top east of North Draw (T 52N, R 71 W, S 21). Boundaries near the Cow Creek County Road and other accessible areas would be posted.
 - A sign program may be able to modify human behavior through an indirect approach (Manning).
 - Create informative “Burnt Hollow” pamphlets which include maps, history of the area, wildlife, BLM’s responsibility, possible recreation activities etc. To reduce littering, the pamphlets may only be available offsite.
 - Information signs shall be provided at all trailheads. Information that may be included is BHMA specific regulations and information, map, etc.
2. Trailheads: Two trailhead parking areas shall be developed off Wyoming Highway 59 (Figure 2.1). Trailhead facilities would include garbage receptacles, information boards, and visitor registration boxes. Temporary or permanent restroom facilities consistent with the Americans with Disabilities Act (ADA) shall be provided. Trailheads shall provide adequate space for parking and movement of ten full-size pickup trucks and three full-size pickup trucks with horse trailers. The trailheads will be fenced to deter off-road travel; locked vehicle gates will be installed on the existing roads, and narrow gates for horse users shall be installed. Locations identified for the trailheads are just inside the boundary fence adjacent to existing roads at Cedar Draw (T 52N, R 72 W, S 1 SE) and the Windmill Road (T 53N, R 71 W, S 28 SW). Development preference is the Windmill trailhead followed by Cedar Draw. A survey drop box will be available to collect users’ satisfaction levels and recommendations for recreation management.
3. Roads and Trails: Existing roads and trails shall be available for non-motorized use including, but not limited to, hiking, horseback riding, and mountain biking (Figure 2.1). No new roads would be constructed. Vehicle access for management purposes shall be limited to existing roads, shall be kept to a minimum, and shall not be authorized during wet conditions or when resource damage is likely. Vehicle access would be authorized for medical emergencies.
4. Monitoring: Recreation resource (pre-existing roads, game trails, fire lines, etc.) use shall be monitored. Specific sites receiving heavy use may be

Figure 2.1 Recreation Facilities Proposed in Alternative 2 of the Burnt Hollow Management Plan.



identified for improvement while unused resources may be reclaimed. Facilities and other improvements, including signs, shall be monitored and maintained as necessary.

5. Law Enforcement Program: A law enforcement program would be implemented to supplement patrols by the BLM ranger. The program would entail pursuing a cooperative agreement with the Campbell County Sheriff to patrol developed sites. Sheriff deputies would be able to enforce state and local violations, but would not be able to enforce Federal resource violations. The increased presence of law enforcement officers should deter violations of all types.

A volunteer host or group would be sought to oversee management of the BHMA. Volunteers would have no law enforcement authority. Their presence should deter resource damage and violations, volunteers would educate users on resource concerns, and report violations to the BLM ranger.

6. Education Facility: An education facility would be constructed and available for organized use. A location has not been selected, possible locations include Cedar Draw or Cow Creek, access is the limiting factor. An all weather access road, suitable for school buses, would be required. A Cow Creek location is preferred by the CRM, however, access is not currently available. An existing road provides access to Cedar Draw and a suitable site could be located.

Partnerships shall be pursued to manage the education program and facility. One potential partner is the Wyoming Chapter of the National Audubon Society. The Audubon Society is interested in developing an environmental education facility in the Gillette area. The timing for establishing a partnership with the Audubon Society is appropriate.

If a partnership is not established, some of the desired features for an education program and facility include the following:

- Small cabin (14 ft. x 14 ft.) for classroom and storage, meeting ADA standards.
 - Teepee for classroom
 - Graveled parking area sufficient for school busses to turn around.
 - Pack-in Pack-out garbage program.
 - Restroom facilities consistent with ADA standards.
 - An interpretive nature trail, suitable for wheel chairs, approximately one-half mile in length.
 - A site coordinator to maintain the facilities and schedule classes.
7. Special Recreation Permits: Special recreation permits for the Burnt Hollow Management Area would be available. BLM guidelines for permit issuance would be followed; effects of issuing a special recreation permit on other

resources would be evaluated. Commercial outfitting permit areas would correspond to livestock allotments, this is the predominant pattern for current outfitting permits in the area. No overnight facilities would be permitted.

8. Firearm Prohibition: Firearm discharge would be prohibited except for hunting. Prohibited activities shall include, but are not limited to, target shooting, paint balls, trap, and skeet.
9. Special Management Area: The BHMA would not be evaluated for special management consideration such as Area of Critical Environmental Concern (ACEC).

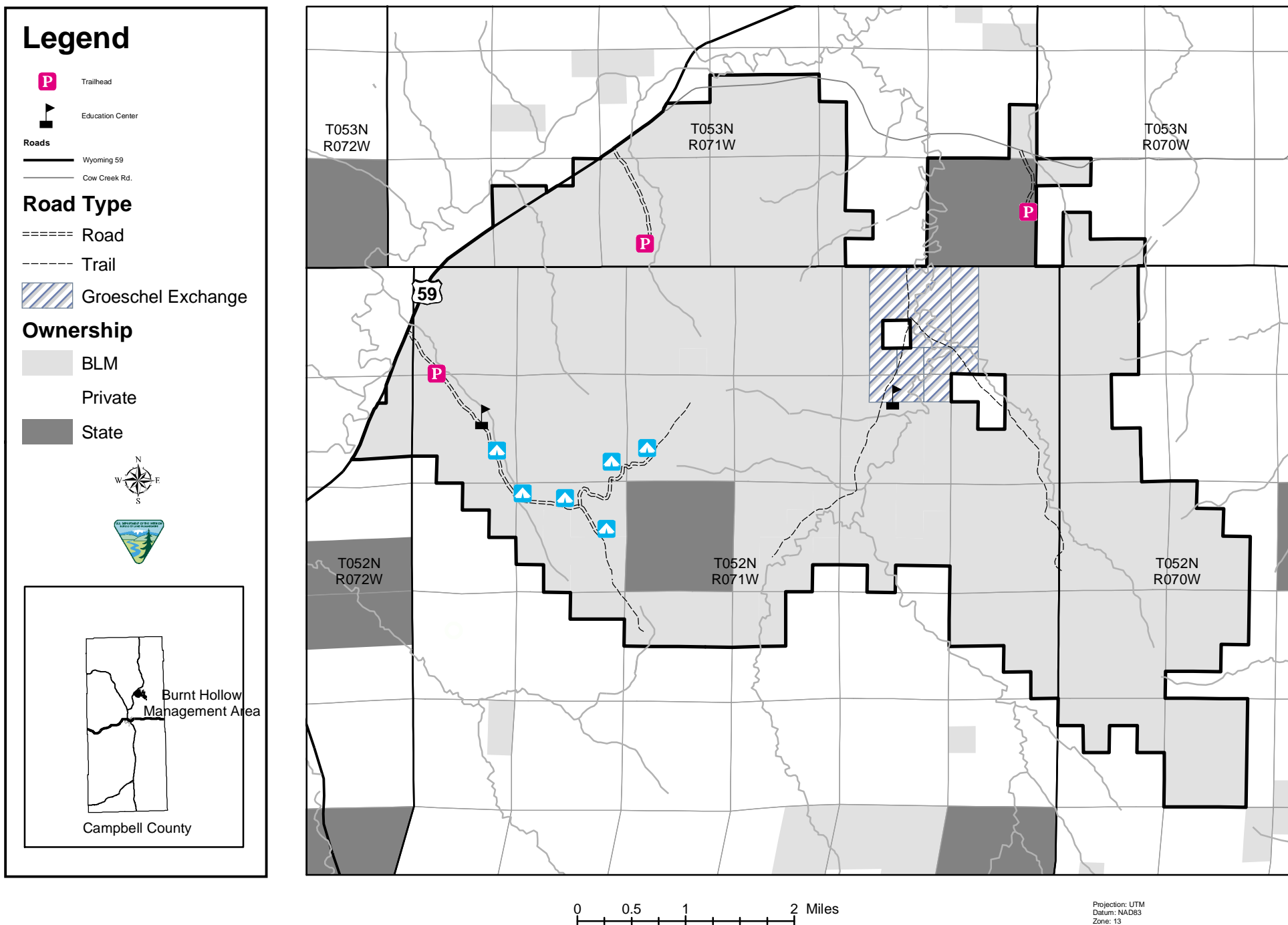
Alternative 3 (Semi-motorized)

The goal for this alternative is to create and manage recreational opportunities for all users that are compatible with other resources, respects the unique qualities of the land, and provides educational opportunities.

Action items the BLM interdisciplinary team identified to meet the alternative's goal are as follows:

1. Sign Program: Same as Alternative 2.
2. Trailheads: Three trailhead parking areas shall be established (Figure 2.2). Trailhead facilities would include garbage receptacles, information boards, and visitor registration boxes. Temporary or permanent restroom facilities consistent with the Americans with Disabilities Act shall be provided. Existing livestock water sources shall be modified to provide separate water sources for recreation stock animals. Trailheads shall provide adequate space for parking and movement of ten full-size pickup trucks and three full-size pickup trucks with horse trailers. The trailheads will be signed to deter off-road travel; locked vehicle gates will be installed on the existing roads, and narrow gates for horse users shall be installed. Locations identified for the trailheads are as follows:
 - a. Cedar Draw: Approximately ½ mile in from WY 59 near existing windmill (T 52N R 71W S 7)
 - b. Windmill: Approximately ½ mile in from WY 59 near existing windmill (T 53N R 71W S 33).
 - c. School Section: Approximately 2/3 mile in from Cow Creek Rd. (T 53N R 71W S 36). This trailhead would not have a stock water source developed. An easement from the State of Wyoming would be necessary.
3. Roads and Trails: Existing roads shall be available for motorized use (Figure 2.2). Seasonal closures for resource protection shall be applied, roads shall be available for motorized use from June 1 through August 31. The Cedar Draw Road and Windmill Roads will be upgraded and surfaced to provide all

Figure 2.2 Recreation Facilities Proposed in Alternative 3 of the Burnt Hollow Management Plan.



weather access to developed facilities. An all weather road would be designed and constructed to the School Section trailhead, if approved by the State of Wyoming. Roads proposed and developed to manage other resources (minerals, fire suppression, etc.) shall be kept to a minimum, and will be evaluated for motorized recreation use.

4. Monitoring: Recreation resource (roads, campsites, trails, fire lines, trailheads etc.) use shall be monitored. Specific sites receiving heavy use may be identified for improvement while unused resources may be reclaimed. Facilities and other improvements, including signs, shall be monitored and maintained as necessary. A survey would be developed requesting user comments on current and proposed management.
5. Law Enforcement Program: Same as Alternative 2.
6. Education Facility: Same as Alternative 2.
7. Special Recreation Permits: Same as Alternative 2.
8. Firearm Prohibition: Same as Alternative 2.
9. Special Management Area: The BHMA shall be managed to preserve it's Area of Critical Environmental Concern (ACEC) characteristics. Area of Critical Environmental Concern designation is used where special management is needed to protect important historical, cultural, scenic, and natural values. The ACEC designation can also be used to identify areas that are hazardous to human life and property. The BLM is directed to evaluate newly acquired lands, the BHMA was evaluated for ACEC suitability (BLM 2003). The evaluation recommended the BHMA for ACEC designation based on the relevance criteria for scenic value, important geologic features, and fragile watershed, and based on the importance criteria for local significant qualities; national priority concerns, and public concerns for management. This management plan shall ensure management actions protect the ACEC relevance and importance criteria; ACEC designation shall be analyzed during the next resource management plan revision.
10. Developed Camping: Developed campsites, approximately 10, shall be located along the Cedar Draw Rd. Campsites would include a fire place, picnic table, hardened parking area, and an outhouse. One or two water pumps would be developed for human use. The Cedar Draw Road would be upgraded and surfaced to provide all weather access. The Cedar Draw Road would be gated at the trailhead and closed seasonally to reduce wildlife disturbance, the road would be open for motorized use from June 1 to August 31.

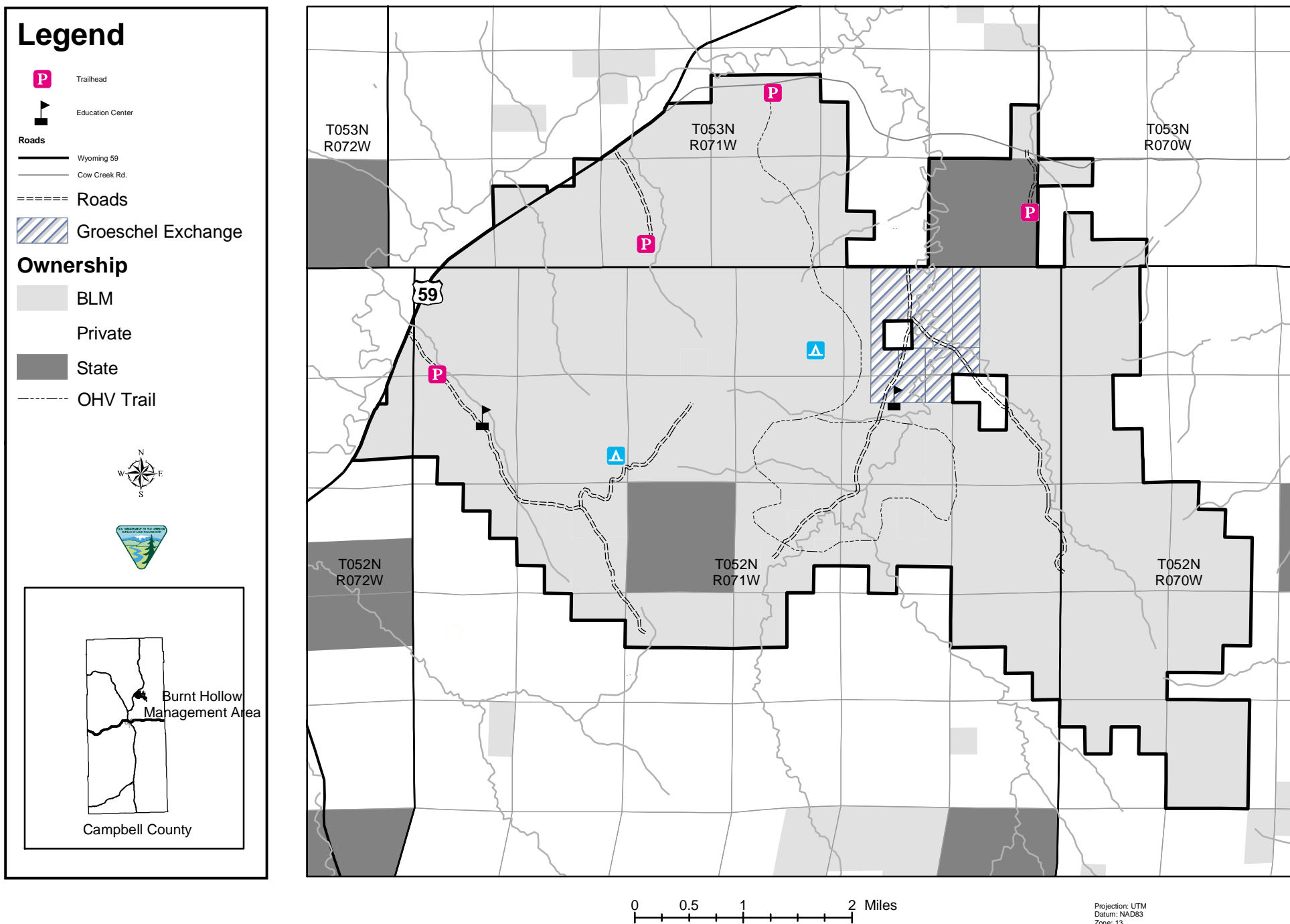
Alternative 4 (Developed Motorized)

The goal for this alternative is to provide developed and motorized recreational opportunities that consider other resources, respect the land, and provide educational opportunities.

Action items the BLM interdisciplinary team identified to provide motorized and developed recreation opportunities while providing for other resource concerns are as follows:

1. Sign Program: Same as Alternative 2.
2. Trailheads: Same as Alternative 3.
3. Roads and Trails: Existing roads would be available for motorized use (Figure 2.3). No seasonal vehicle closure would be enacted, signs recommending no motor vehicle travel during wet conditions would be posted. The Cedar Draw Road and Windmill Roads would be upgraded and surfaced to provide all weather access to developed facilities. An all weather road would be designed and constructed to the School Section trailhead, if approved by the State of Wyoming. Additional trails would be considered including specialized trails, such as trails designed for mountain bicycling and other specific uses. A highline trail could be sited along the ridges north of Cedar Draw. Roads proposed and developed to manage other resources (minerals, fire suppression, etc.) would be available for motorized recreation use.
4. Monitoring: Recreation resource (roads, campsites, trails, fire lines, trailheads etc.) use shall be monitored. Specific sites receiving heavy use may be identified for improvement while unused resources may be reclaimed. Facilities including signs would be monitored and maintained as necessary. A survey would be developed requesting user comments on current and proposed management.
5. Law Enforcement Program: Same as Alternative 2.
6. Education Facility: Same as Alternative 2.
7. Special Recreation Permits: Same as Alternative 2.
8. Firearm Prohibition: Firearm discharge shall not be prohibited. Firearms would be managed in accordance with State of Wyoming regulations.
9. Special Management Area: Designation of the BHMA as an ACEC would not be pursued.
10. Developed Camping: A developed campground shall be designed and constructed, a site has not been determined. The campground would most likely be sited west of Cow Creek or along the Cedar Draw Road. An all

Figure 2.3 Recreation Facilities Proposed in Alternative 4 of the Burnt Hollow Management Plan.



weather access road would be necessary to a campground near Cow Creek. This would be a traditional campground with six to ten family sites located in close proximity along a loop road. In addition a site would be constructed for groups of 50 or more people. Campsites would include a fire place, picnic table, and hardened parking area. An outhouse and garbage facilities would be available within the campground. Potable water would be provided if feasible. A camp host would manage the campground and the Burnt Hollow Management Area.

11. OHV Trail: An OHV trail would be identified and constructed west of Cow Creek into the center of the management area. A trailhead/unloading area would be constructed off the Cow Creek Road (T 53N R 71 W S 27). Trailhead facilities would be the same as in alternative 3, except stock water would not be developed at the OHV trailhead. No seasonal vehicle closure would be enacted, signs recommending no motor vehicle travel during wet conditions would be provided.

2.7 Vegetation Management

Alternative 1 (No Action)

Vegetation management would be consistent with the Approved Resource Management Plan for Public Lands Administered by the BLM Buffalo Field Office (BLM 2001). Management shall maintain or improve the diversity of plant communities to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources; and reduce the spread of noxious weeds.

An EA (WY 070-02-EA-239) was prepared in 2002 to address wildland fuel buildup, forest and rangeland health, watershed restoration, and salvage commercial fire-killed saw timber in the BHMA vicinity (BLM 2002). Vegetation management projects can be implemented in accordance with this EA. The vegetation management EA provides for commercial harvest of available wood products, existing roads and trails are to be used for transportation, no new roads shall be constructed.

1. Forest communities: Forest management actions could be implemented in accordance with the vegetation management EA (WY 070-02-EA-239).
2. Shrubland Communities: Shrubland management actions could be implemented in accordance with the vegetation management EA (WY 070-02-EA-239).
3. Riparian Communities: Riparian management actions could be implemented in accordance with the vegetation management EA (WY 070-02-EA-239).
4. Invasive Weeds: Invasive weed management actions could be implemented in accordance with the vegetation management EA (WY 070-02-EA-239).

5. Wildland Fire: Wildland fire management would be accomplished in accordance with current agreements. Campbell County would provide initial attack on wildland fires, BLM would be contacted for guidance. All wildland fires would be suppressed.

Alternative 2 (Proposed Action)

The CRM team did not identify vegetation as a stand-alone resource, but included vegetation management actions with other resources such as livestock grazing and wildlife. Vegetation management as it relates to other resources shall also be discussed in this EA under the other resources. Action items and issues identified by the CRM team that relate purely to the vegetation resources are included here. The goal for this alternative is to manage the vegetation in a manner that considers and is compatible with other uses particularly forage production and wildlife habitat.

1. Forest communities: Forest management actions could be implemented in accordance with the vegetation management EA (WY 070-02-EA-239). Management activities would be designed to maintain the historic range of vegetation composition and structure by reducing ponderosa pine cover, which should also enhance wildlife habitat and forage production.
2. Shrubland Communities: Shrubland management actions could be implemented in accordance with the vegetation management EA (WY 070-02-EA-239). Management activities would be designed to maintain the historic range of vegetation composition and structure by reducing juniper cover, and increasing age class and species diversity of sagebrush and other shrubs. Active shrubland management shall also enhance wildlife habitat and forage production.
3. Riparian Communities: Riparian management actions could be implemented in accordance with the vegetation management EA (WY 070-02-EA-239). Management activities would be designed to maintain the historic range of vegetation composition and structure by reducing juniper cover, and promoting recovery of the riparian community (alder, cottonwoods, sedges, willows, etc). Exclosures may be constructed to reduce grazing pressure and provide for vegetation monitoring. Riparian restoration would provide additional wildlife habitat and forage for livestock and wildlife.
4. Invasive Weeds: Invasive weed management actions could be implemented in accordance with the vegetation management EA (WY 070-02-EA-239). Recreation stock users would be required to use certified weed-free hay. All management actions would be designed to minimize weed infestations.
5. Wildland Fire: A wildland fire management plan would be developed emphasizing fire's ecological role while providing for other resources. Many

vegetation communities such as ponderosa pine forest and sagebrush shrublands are adapted to fire, fire is essential for the health and maintenance of these communities. Fire suppression activities would be guided by the fire management plan, which would provide for wildland fire for resource use. Fire suppression activities shall emphasize a “light on the land” approach to minimize resource damage, for example the fire management plan may restrict bulldozers and heavy equipment to existing roads, and regulate construction of fire suppression roads. Structures, other developments, and adjacent private lands shall receive protection. Fuel reduction activities and other projects would be implemented to reduce the risk of catastrophic wildfire.

Alternative 3 (Environmental Protection Emphasis)

Management activities would emphasize a “hands off” approach to vegetation management actions, wildland fire suppression, and prescribed burning.

1. Forest communities: The only forest management action implemented in accordance with the vegetation management EA (WY 070-02-EA-239) would be slash pile burning. Management activities would emphasize a “hands off” approach to forest husbandry actions, wildland fire suppression, and prescribed burning.
2. Shrubland Communities: BLM would not implement any of the shrubland management actions addressed under the vegetation management EA (WY 070-02-EA-239). BLM would manage any naturally occurring wildland fires in shrubland communities under the “hands off” approach described for forest communities.
3. Riparian Communities: The only riparian management actions that would be implemented in accordance with the vegetation management EA (WY 070-02-EA-239) would be culvert removal and establishment of low water road crossings and the Cedar Draw Fuel Reduction Project. The fuel reduction contract has been issued and the project scheduled for completion in the spring/summer of 2003. Riparian management would emphasize increasing vegetation density and cover by reducing livestock grazing in riparian zones and possibly use of prescribed fire. Exclosures may be constructed to reduce grazing pressure and provide for vegetation monitoring. Riparian restoration would provide additional wildlife habitat and forage production.
4. Invasive Weeds: Invasive weed management actions would be the same as described in the proposed action alternative.
5. Wildland Fire: BLM would develop a wildland fire management plan emphasizing fire’s ecological role. Naturally occurring wildland fires would be allowed to burn under conditions defined in a site specific Wildland Fire Use for Resource Benefit (WFURB) plan. The WFURB plan would

emphasize use of natural fuel breaks or topographic features to contain fires within the unit. Suppression efforts would emphasize use of hand crews and engines operating from designated roads and trails. Heavy equipment use would only be authorized when the fire posed an immediate threat to human life.

2.8 Wildlife

Alternative 1 (No Action)

The BHMA would continue to be available for wildlife related recreation such as hunting and wildlife viewing. A vegetation management EA (WY-070-02-EA-239) provides for vegetative treatments to improve wildlife habitat quality and increase forage production. Non vegetation management habitat enhancement projects would not be proposed.

Alternative 2 (Proposed Action)

The CRM team's goal for the wildlife resource is to manage for diverse and healthy populations of fish and wildlife.

To accomplish the CRM team's wildlife goal the following action items have been identified:

1. Habitat Management: Provide adequate habitat through active management to provide sustainable well distributed populations. A vegetation management EA (WY-070-02-EA-239) provides for vegetative treatments to improve wildlife habitat quality and increase forage production. Some possible treatment methods include chemical, fire, and mechanical.
2. Hunting: Provide for a semi-primitive hunting experience, the BHMA would be closed to motor vehicles during all big-game hunting seasons. (Vehicle access was discussed in Recreation's proposed action.)
3. Mule deer: Habitat enhancements would be designed for the benefit of mule deer. Management regulations proposed by the WGFD that would benefit mule deer would be supported by the BLM.
4. Population inventory: Population and habitat inventories will be conducted to document baseline conditions and monitor management effects. An effective monitoring program shall enable an adaptive management approach to wildlife and habitat management.
5. Predator management: No animal damage control is allowed on BLM administered public lands unless a need for control, economically significant predation on livestock, is determined. USDA Wildlife Services is the only agency approved to control predators on public lands. The animal damage control process and approved control methods were analyzed in the "Environmental Assessment for Predator Damage Management in Eastern Wyoming" (BLM

2001, APHIS 1998).

Recreational predator hunting is permissible in accordance with WGFD regulations. Hunters inquiring about areas to hunt predators shall be directed to the Burnt Hollow Management Area.

6. Range Improvements: Water developments for livestock will be designed with waterfowl and other wildlife in mind – including fencing, graveled water gaps, conversion of abandoned oil wells, or stock tanks. Fences and other range improvements shall also be designed for wildlife compatibility.
7. Species diversity: Species diversity shall be enhanced by developing water sources (action items 6 & 8) and active habitat management (action items 1, 6, & 8).
8. Waterfowl: Habitat enhancements would be designed to provide waterfowl nesting and foraging habitats.

Alternative 3

The goals for wildlife management under this alternative are to:

1. Improve biological diversity of plant and animal species;
2. Support WGFD population objectives to the extent consistent with BLM objectives;
3. Improve forage production and wildlife habitat quality; and
4. Provide habitat for special status species.

To accomplish the wildlife management goals of alternative 3 the following action items would be implemented:

1. Habitat Management: An active habitat management program shall be implemented to enhance wildlife habitat quality and increase biodiversity in accordance with the wildlife management goals. A vegetation management EA (WY-070-02-EA-239) provides for vegetative treatments to improve wildlife habitat quality and increase forage production. Some possible treatment methods include chemical, fire, and mechanical.

Forest community treatments shall be designed to maintain the historic range of vegetation composition and structure. For example, reducing ponderosa pine density should provide an open canopy with enhanced understory structure and diversity.

Shrubland community treatments shall be designed and implemented to provide a mosaic of diverse sagebrush age classes, within the historic range of composition and structure. No more than 20% of the sagebrush shall be treated within a 30-year period in accordance with sage grouse management guidelines (Connelly et al. 2000, WGFD 2002). Juniper cover within sagebrush communities shall be

reduced. Treatments would be designed to break up mat vegetation and increase grass and forb production.

Riparian communities are amongst the most biologically diverse and productive communities. Management activities shall be designed to restore the non-functioning riparian communities including Cedar Draw, Cow Creek, Hells Canyon Draw, and Provant Creek. Treatments may include reducing juniper cover, and promoting recovery of the riparian community (cottonwoods, sedges, willows, etc). Exclosures may be constructed to reduce grazing pressure and provide for vegetation monitoring.

2. Hunting: Hunting opportunities shall be provided in accordance with WGFD regulations and the recreation resource direction of this Burnt Hollow Management Plan.
3. Mule deer: Single species management shall not be emphasized. Habitat enhancements that increase biological or habitat diversity and are beneficial to mule deer would be supported.
4. Population inventory: Population and habitat inventories shall be conducted, as resources allow, documenting baseline conditions and monitoring management effects. An effective monitoring program shall enable an adaptive management approach to wildlife and habitat management.
5. Predator management: No animal damage control is allowed on BLM administered public lands unless a need for control, economically significant predation on livestock, is determined. USDA Wildlife Services is the only agency approved to control predators on public lands. The animal damage control process and approved control methods were analyzed in the “Environmental Assessment for Predator Damage Management in Eastern Wyoming” (BLM 2001, APHIS 1998).

Recreational predator hunting is permissible in accordance with WGFD regulations.

6. Range Improvements: Improvements for livestock management shall be designed where possible to benefit and minimally be compatible with wildlife; for example, fences would be designed to allow for wildlife passage.
7. Species diversity: Implementation of the other wildlife action items shall provide for species diversity.
8. Waterfowl: Wetland enhancements shall be designed to provide waterfowl nesting and foraging habitats. Potential waterfowl habitat enhancement locations have been identified by Ducks Unlimited. Water developments for livestock shall be designed to enhance waterfowl habitat.

Alternatives Considered but Eliminated

Elimination of Predators: Members of the Wildlife Technical Resource Team suggested predators be eliminated from the BHMA. Predator elimination conflicts with BLM's Approved Resource Management Plan and the agreement with USDA Wildlife Services, which state a need for control must be determined (BLM 2001, APHIS 1998). Predator elimination also conflicts with the CRM team's goal and BLM's wildlife management objective to increase biodiversity.

Elimination of Select Species: Members of the Wildlife TRT recommended populations of certain species such as elk, mountain lions, and white-tailed deer be eliminated, or at least minimized, within the BHMA. Extirpation of native wildlife species conflicts with the CRM team's goal and the BLM's RMP wildlife management objective to increase biodiversity (BLM 2001). The identified species are game animals for which the WGFD has the overall management authority and has implemented regulations to effectively manage these species.

CHAPTER 3. AFFECTED ENVIRONMENT

Annual precipitation within the BHMA is 15 to 17 inches. The topography varies from rolling sagebrush-grasslands to steep precipitous drainages, scoria buttes and clayey outcrops with juniper and ponderosa pine uplands. Several intermittent drainages contain plains cottonwood and junipers. Springs and small wetlands are scattered throughout the BHMA. Livestock grazing, wildlife habitat, and limited mineral development are the historic land uses.

3.1 Air Quality

Air quality in the BHM area is considered very good, due to limited air pollution emission sources and good atmospheric dispersion conditions (BLM 2002). The main sources of air pollution are particulates from natural sources, vehicle traffic, surface coal mines, power plants, and oil and gas development. Occasional high concentrations of carbon monoxide and particulate matter occur within the developed areas of Campbell County. The Wyoming Department of Environmental Quality recognizing increasing particulate readings approached Campbell County, the coal mines, and the coal bed methane operators and has made a significant effort to reducing road-borne particulates (BLM 2002).

3.1 Land Uses and Land Use Capability

The lands are presently used for livestock grazing and wildlife habitat; mineral development is limited to a few abandoned drill holes. There are some springs, wetlands and intermittent riparian areas for water sources. Recreational hunting for trophy class mule deer has historically been excellent due to controlled access.

3.2 Cultural and Historic Resources

The Burnt Hollow Management Area is part of the Little Powder River corridor, an easy travel route between the breaks south of the Yellowstone River and the Cheyenne River drainage, a path east to the Black Hills, or south to the Platte. The BHMA lies east of the Little Powder River stream channel, south of the Cow Creek Road, is characterized by two ridge systems, and an interior valley, the drainage of Cow Creek. The drainage lends its name to the eastern ridge system, the “Cow Creek Breaks”. At this time, the western ridge lacks its own name, but contains a tributary to the Little Powder, called “Cedar Draw”, for the numerous junipers found there.

Cultural Settlement Patterns

Successful human occupation of the region involved a thorough understanding of the available resources, including water sources, travel routes, animal lifeways and probable weather patterns. The Powder River Basin has a dry climate, precluding farming or intensive cultivation of most plant crops due to the short growing season. Severe winters require planning and preparation for food, fuel and shelter, when game is less available. However, when summer restores grass and water, the wildlife returns in abundance, making the Powder River region a well-loved hunting ground.

Prehistoric

The earliest known human occupation in the region is the Clovis culture, people who hunted mammoth about 11,000 B.C. Evidence of several Paleoindian groups has been found north of Gillette, and these people probably traversed the BHMA. Research in the immediate vicinity of BHMA documents occupation by Middle Archaic peoples (5000-1000 B.C.) along the river corridor, succeeded by Later Archaic cultures (1000 B.C.-A.D. 500). A severe erosion cycle followed the Late Archaic period, stripping much of the sediment and the record of human occupation from this region. The Late Prehistoric occupation period (A.D. 500 to 1700) coincided with an expansion in the bison population. Once more distant peoples obtained the horse and access to Euro-American trade goods, they pressed into the bison lands of the high plains, interacting with the people already there.

Acquisition of the horse and improved weaponry allowed concentration on bison hunting, and a wider sphere of activity for the tribes who had them. Since the BHMA lies adjacent to the Little Powder, a relatively reliable water source, it probably offered a route of travel throughout human occupation. While a number of Native American groups may have traversed the region, at the beginning of the historic era, the tribes with long occupations in the region included the Shoshone, Arapaho, Blackfeet, Gros Ventres, Crow and Kiowa. People from the Missouri, including the Mandan, Hidatsa and Arikara, were familiar with the area. As population pressure east of the Missouri increased, the Cheyenne and Sioux moved onto the Plains.

Euro-American exploration of the region dates to the early nineteenth century, although French traders may have reached the area earlier. The Reynolds Expedition of 1859 passed through the general region, exploring the Belle Fourche and main Powder River drainages, but did not traverse the Little Powder. However, guide and mountain man Jim Bridger provided detailed information on the area. Better agricultural land and discoveries of precious metals elsewhere distracted attention from the region for several decades, and it became a reservoir for the Native American tribes affected by encroaching Euro-American settlement.

The Fort Laramie Treaty of 1851 did not assign the region to a particular tribe, but described it as common hunting grounds. Following the Civil War, Native American tribes battled with each other and the post-war Army for control of the region. At this time, the tribes known to occupy the region included the Shoshone, Arapaho, Blackfeet, Crow, Hidatsa, Arikara, Cheyenne and Siouian peoples. A later treaty in 1868 awarded the region to the Sioux, ignoring other tribal entities' use, leading to intertribal conflict.

Historic

Euro-American settlement came to the region with the establishment of military forts along the Bozeman Trail in 1866. While forts on the western edge of the Powder River Basin were abandoned following the Treaty of 1868, other forts were established. Army explorations continued. The resident Cheyenne and Sioux found themselves in conflict with the US Army and encroaching gold miners. Resistant groups who entered into

hostilities with the army and other tribes, leading to a number of military conflicts in 1876. By 1877, all the indigenous peoples had been assigned to reservations outside the Little Powder River drainage, and the area was open for Euro-American settlement. By 1880, cattle ranchers were expanding into the Powder River Basin.

By 1886, the ranges in Montana, Wyoming, and the Dakotas were overstocked, and a severe drought followed by a severe winter resulted in the collapse of the grazing industry. Ranchers restocked their ranges, bringing in large herds from Texas and the eastern plains. The trail bringing cattle from Nebraska into Wyoming and eastern Montana was one of the last, and was named the “Texas Trail”. A branch of this trail passed down Cottonwood Creek and joined the Little Powder just north of the BHMA. The 1890’s saw a fair amount of use of this particular trail. The Texas Trail is considered an eligible National Register site, but the trail corridor lies outside the perimeters of BHMA.

Homesteading lagged in the Little Powder River area until more desirable areas had been claimed. By 1922, the region had reached a historic settlement climax, but the period was followed by a cycle of drought, financial failure, and reorganization, which resulted in many farms and ranches being combined into larger units. Many small communities identified by their Post Office names disappeared with the diminishing population. Ranchers located on good water sources, or in possession of a mix of environmental zones, were able to hang on. Patenting of public lands continued into the ‘30’s, but ceased in this area with the passage of the Taylor Grazing Act, leaving much the present pattern of public and private land ownership. Oil and gas leasing of public minerals began in the late 1940’s, with development of these resources following about twenty years later. The coal mines south of the area are bounded by the “burn line”, and do not extend into the area. The former coal measures caught fire, burning out much of the subsurface coal, resulting in the local rugged scoria hills and parkland topography.

Cultural Inventory

Inventory in and immediately adjacent to Burnt Hollow totals 2300 acres, including 1600 acres surveyed for a Class II block sampling survey, 160 acres for nearby land exchanges, and 380 acres for oil and gas developments, not counting linear surveys for access roads and seismic lines. Of the 33 planned and 31 drilled oil and gas wells in the area, only 9 or 10 were inventoried for cultural sites prior to drilling; the other wells were located before cultural inventory was required under NEPA and FLPMA.

Cultural inventory in the area totals approximately 2300 acres of Class III inventoried acreage, distributed in the following townships within BHMA:

Township & Range	Acres in BHMA	Acres Inventoried	No.of Cultural Sites
T52N,R70W	3560	1235	1
T52N,R71W	10,320	902	1 *
T52N,R72W	210	None	1 *
T53N,R70W	160	40	0
T53N,R71W	2700	120	4*

*Historic road counted in three townships

Including contiguous sections, a total of 23 cultural properties have been recorded in the vicinity. These sites include: 12 lithic scatters, 10 campsites or occupations, and one historic road, now the roadbed of Highway 59, and the Texas Trail. Of these, only five are located within Burnt Hollow proper: 48 CA 732, 2532, 2533, 2534 and 3075. One occupation site has been determined Eligible to the National Register of Historic Places; another is of unknown eligibility. Two lithic scatters and the historic road have been determined Not eligible. Other prehistoric and historic era sites are known to exist in the SMA, but have not yet been recorded.

Research Potential

Cultural inventory in the area to date has not produced a comprehensive prehistoric or historic synthesis, but the potential is high. Some zones will be more productive than others, in that sediments will tend to be preserved in place, whereas other areas are subject to extensive erosion. There is good potential for locating sites which can provide information on the Late Archaic erosion cycle or event, as well as a more recent erosion/deposition cycle known as the Kaycee terrace. The drainage of Cow Creek contains deeply cut erosion channels; the age of these features will provide important information on regional environmental history. Several types of Late Prehistoric projectile points have been found in the general area, indicating the study area has potential to throw light on different, but contemporary, cultural groups using the same area.

Existing inventory has been accomplished through project-oriented surveys, focusing on a specific development or objective, usually mineral development or federal land exchanges. Project-driven inventory appears to under-estimate cultural potential in this area. A survey strategy oriented to environmental zones, water sources, soils, lithic resources, travel routes and overlooks may be more productive.

Native American Concerns

When the 60 Bar Land Exchange was proposed, all Native American tribes with known interest in the Powder River Basin were notified by certified letter, and their comments and concerns were requested. An information packet containing maps of the exchange and discussion of objectives was sent to each tribal group. At that time, the lands now known as Burnt Hollow Management Area were in private ownership. No written response was received from the notification.

Sites of Native American interest could include both prehistoric and historic sites, rock art, stone circles and cairns, constructs such as fortifications or vision quests, battle sites, burials, or localities which are sacred or part of tradition; such sites need not have man-made features, but have contexts preserved through song, prayer or oral history. There are presently no documented Native American sacred sites or traditional cultural properties in the immediate study area. Given the location of the study area adjacent to a major north-south travel route, and proximity to the Bear Butte and Bear Lodge sacred sites by way of other travel routes, there is potential for localities of significance to Native American groups.

3.3 Livestock Grazing:

Livestock grazing has historically been the dominant land use within the BHMA. Approximate allotment boundaries and fence lines are displayed in Figure 3.1.

The Missouri River Basin range survey (1957) rated the public lands within the allotment at 1650 AUMs. In 1999 an Ecological Site Inventory (ESI) was conducted. That inventory estimated 3593 AUMs available within the entire allotment. Based on BLMs more recent inventory and stocking rate determinations, the 1650 AUMs are a conservative estimate of the annual forage production. The 3593 AUMs over estimates the actual number of AUMs that are available for livestock to graze, as many areas are in steep terrain or too far from a water source to be grazed by livestock.

Figure 3.1 Approximate Allotment Boundary and Fence Lines within the Burnt Hollow Management Area, Campbell County, Wyoming.



The use authorized under the grazing lease is for 2400 AUMs with a variable season of use. Additional AUMs may be authorized after the Allotment Management Plan is implemented. Historically the allotment has been used as follows

The Big Pasture	November - May
Cow Creek Meadows	June - July
Burnt Hollow Pasture	July - October

The allotment is categorized as an "Improve (I) allotment". The criteria for the categorization are one or more of the following: large blocks of public land; range condition has been rated poor to fair or trend is static or downward; resource concerns have been identified, and opportunities exist for positive return on public investment in management planning and project development. The 60 Bar Allotment falls under this category due to the large block of public lands.

Some of the Range improvements on the allotment include:

#5138 Holler Well – T53N., R71W., Section 32

#6254 Lower Cedar Draw Spring and Reservoir – T53N., R71W., Section

#6255 Upper Cedar Draw Spring – T53N., R71W., Section

#6256 Bob Reservoir – T53N., R71W., Section

Other range improvements exist, but have not yet been surveyed.

3.4 Mineral Resources

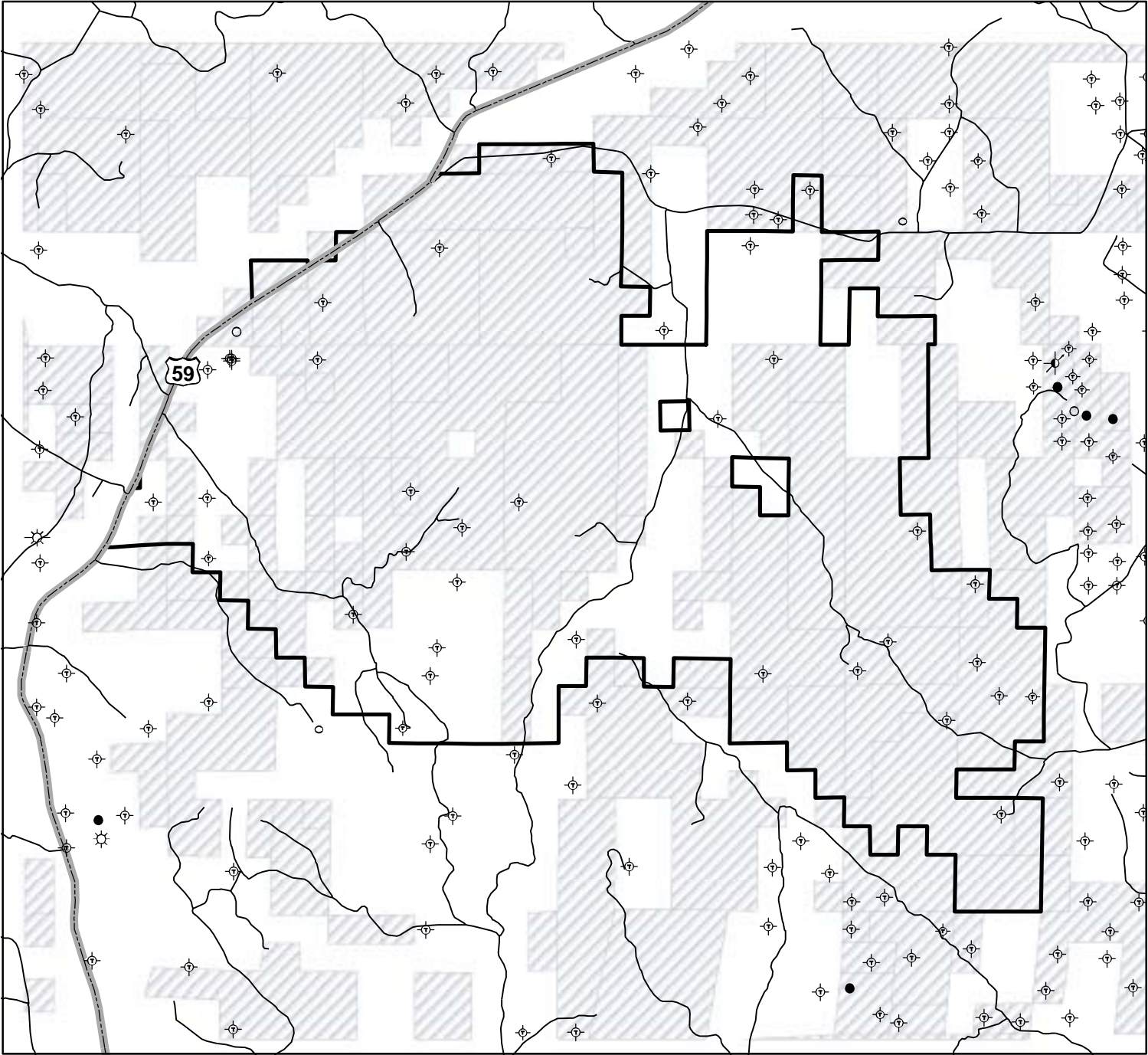
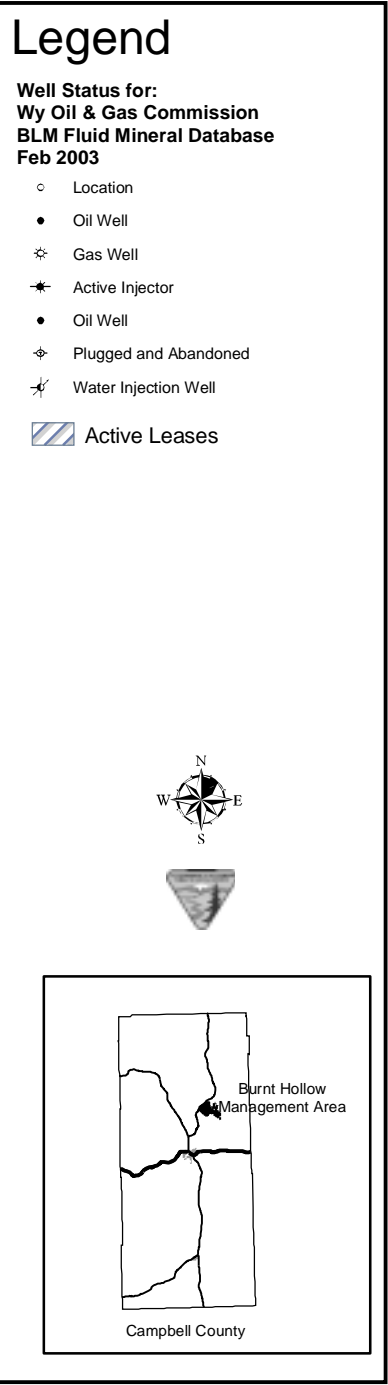
There are approximately 18,030 acres of potentially leaseable land in the Burnt Hollow area. Of the leaseable lands, 39 active oil and gas leases encompass approximately 13,700 acres while the remaining acreage is available for leasing (Figure 3.2). Approximately two-thirds of the leases contain lands both inside and outside the BHMA. Only one of the active leases is “held by production”, meaning the lease will continue to be held as long as it produces. The other active leases have expiration dates ranging from 1/31/2003 to 5/31/2010. Approximately 17 of these leases currently have timing stipulations, to protect sage grouse nesting habitat.

Additionally, there are approximately another 1730 acres of unleased Federal oil and gas minerals. In Wyoming, leaseable lands (i.e. leases that have terminated) are not automatically re-leased. A parcel must first be nominated for an upcoming sale. There are approximately 2600 acres within the Burnt Hollow area that the Federal government does not own the oil and gas rights. Approximately 1280 of these acres are owned by Wyoming.

Conventional wells:

Between 1960 and 1998, 31 conventional oil wells were drilled in the Burnt Hollow area, all were dry holes. The wells were typically drilled in the 1960's and 1980's as conventional Minnelusa tests. The typical total depth of the wells was between 8,000 and 9,000 feet. The deepest well drilled was 9300 feet. Most of the existing roads in the BHMA were developed or upgraded for these wells. There are producing oil wells

Figure 3.2 Mineral Status within the Burnt Hollow Management Area, Campbell County, Wyoming



0 0.5 1 2 Miles

Projection: UTM
Datum: NAD83
Zone: 13

within two miles of the BHMA on all sides.

Coalbed Methane Exploration:

In November 1997, an 800 foot coal bed methane well was drilled in Section 21, T. 52 N., R. 71 W. The operator originally reported that the Upper Wyodak coal seam was encountered at the surface, and the K-C coal seam was encountered at 458 feet below surface. A BLM review of the well logs indicates no coals were encountered. The well was dry, and was plugged in January 1998. There have been no other coal bed methane wells drilled within the Burnt Hollow area. The BHMA lies east of the coal outcrops (BLM 2002), and is believed to have limited potential for recoverable coal bed methane resources.

Nearest Production:

East: over one mile to the east of the Burnt Hollow area, in Sections 4 and 5, T. 52 N., R. 70 W., and Sections 33 and 34, T. 53 N., R. 70 W. Minnelusa production has been established since the 1980's.

South: approximately one mile to the south of the Burnt Hollow area, in Section 31 T. 52 N., R. 70 W, a Minnelusa well produced from 1979 to 1988, when it was abandoned. The Springen Ranch Muddy Unit was established in 1973 in the south central portion of T. 51 N., R. 71 W. The unit was terminated August 2, 2001 due to cessation of production. Since the early 90's Muddy production has been established in Sections 18 and 20, T. 51 N., R. 71 W.

West: slightly over one mile to the west of the Burnt Hollow area in Section 14 T. 52 N., R. 72 W, Minnelusa production has been established since 1982.

North: approximately two miles to the northwest of the Burnt Hollow area, in Section 18, T. 53 N., R. 71 W. Muddy production has been established since 1988. Approximately four miles to the northeast of the Burnt Hollow area, in Section 16 T. 53 N., R. 70 W., Minnelusa production has been established since 1985.

3.5 Recreation Resources

Prior to the land exchange recreational access was controlled by the private landowners; two BLM parcels of 80 acres each along the Cow Creek County Road and two BLM parcels of 40 and 400 acres along WY 59 were available for public use. Trespass from these parcels on to private property, and vandalism of fence and range improvements within these parcels are occasional occurrences. Access for big-game hunting was available through an outfitter whom leased the private lands and was permitted by BLM to hunt the public lands. Mule deer were carefully managed to produce trophy class antlers. The entire 18,600 plus acre BHMA is now available for non-motorized recreation use. A temporary motor-vehicle closure has been placed on the BLM administered public lands until November 1, 2003.

The few existing two-track roads within the BHMA were created for mineral exploration and/or livestock management. Two tracks along Provant Creek and within Hells Canyon

Draws originate on private property and remain inaccessible for vehicle use. The Windmill Road extends approximately one mile, from WY-59 (T 53N R 71W S 28 SW) into the southern half of section 33. The Cedar Draw Road was originally constructed for oil exploration, the road has received minimal maintenance over the years. This road parallels the southwestern boundary of the management area originating from WY-59, a spur road extends northeasterly into the center of the BHMA (T 53N R 71W S 9 NE).

Both the Cedar Draw and Windmill Roads would require upgrading to meet BLM standards for public use. A number of water developments for livestock are scattered throughout the BHMA and may become available for recreational stock use. There are no other existing facilities that would be available for recreational use. Previous activities such as livestock grazing and fire suppression have created a network of smaller trails off of the main two-track roads into the rougher terrain which. Many remain visible today and offer access for recreation use.

3.6 Social-Economic

Campbell County is dependent upon energy development for much of its economic stability, producing more than 90% of the coal and 25% of the oil within Wyoming. Minerals and related industries employ the largest percentage of the Campbell County workforce. Presently there is a large amount of coal bed methane drilling and associated development taking place. Additional economic influence is present from local government, retail trade, services, and agricultural interests.

The 2000 population of Campbell County was estimated at 33,698 with 19,646 residents within the Gillette city limits (BLM 2002). The Campbell County population grew 14.7% between 1990 and 2000. The county's population is expected to grow another 4% by 2008.

3.7 Soils

A detailed soil survey is in the preliminary mapping stages for northern Campbell County (BLM 2003). A general state-wide soil map (STATSGO) indicates the BHMA to be within map units WY053 and WY127. WY053 comprises the east face of the Cow Creek Breaks, while the remaining of the BHMA falls within WY127. The three dominant soils within map unit WY053 are Shingle, Cushman, and Taluce; the three dominant soils within map unit WY127 are Kishona, Shingle, and Theedle. Shingle is a loam to clay loam commonly on slopes, erodes easily, and has poor revegetation potential. Cushman is a clay loam found on slopes less than 15%, it does not present an erosion hazard and can be revegetated. Taluce is a fine sandy loam on low to moderate slopes, it does not present an erosion hazard but is difficult to revegetate. Kishona is a loam on slopes less than 15% it does not present a severe erosion or revegetation hazard. Theedle is also a loam on more moderate slopes (3-40%) and also does not pose severe erosion or revegetation hazards. These soils are typical of semiarid grasslands. Generally they range from the clay dominated soils (i.e. Shingle) on the tops and sides of steep drainages to more silt and sand dominated soils (Kishona and Theedle) in the lower less steep areas.

3.8 Vegetation

The predominant vegetation types are prairie (52%), sagebrush-grassland (42%), and ponderosa pine (*Pinus ponderosa*) stands (4%) (Figure 3.3). Big sagebrush (*Artemisia tridentata* spp.) is the most common shrub, the most common grasses within the sagebrush communities include western wheatgrass (*Agropyron smithii*), needle and thread (*Stipa comata*), Indian ricegrass (*Oryzopsis hymenoides*), and prairie junegrass (*Koeleria pyramidata*). Rocky Mountain juniper (*Juniperus scopulorum*) is common within the sagebrush communities, particularly on hillsides and along drainages.

The prairies are level to rolling, predominant grasses include western wheatgrass, Indian ricegrass, needle and thread, blue grama (*Bouteloula gracilis*), and Sandberg bluegrass (*Poa sandbergii*). Common forbs include buckwheat (*Eriogonum umbellatum*), yarrow (*Achillea lanulosa*), and prickly pear cactus (*Opuntia* spp.).

The wetland and riparian areas contain plains cottonwood (*Populus sargentii*), juniper and sedges (*Carex* spp.) and rushes (*Juncus* spp.) at the springs and wetland areas. The upper slopes contain ponderosa pine/juniper, with an under-story of sagebrush, grasslands.

In 1999, an Ecological Site Inventory was conducted in association with the grazing allotment. The following is a summary of the number of acres of each seral stage (ecological condition):

Acres per Seral Stage					
Potential Natural Community	Late	Mid	Early	Unclassified	Total
1219 (8%)	8155 (52%)	2489 (16%)	221 (1%)	3475 (22%)	15560*

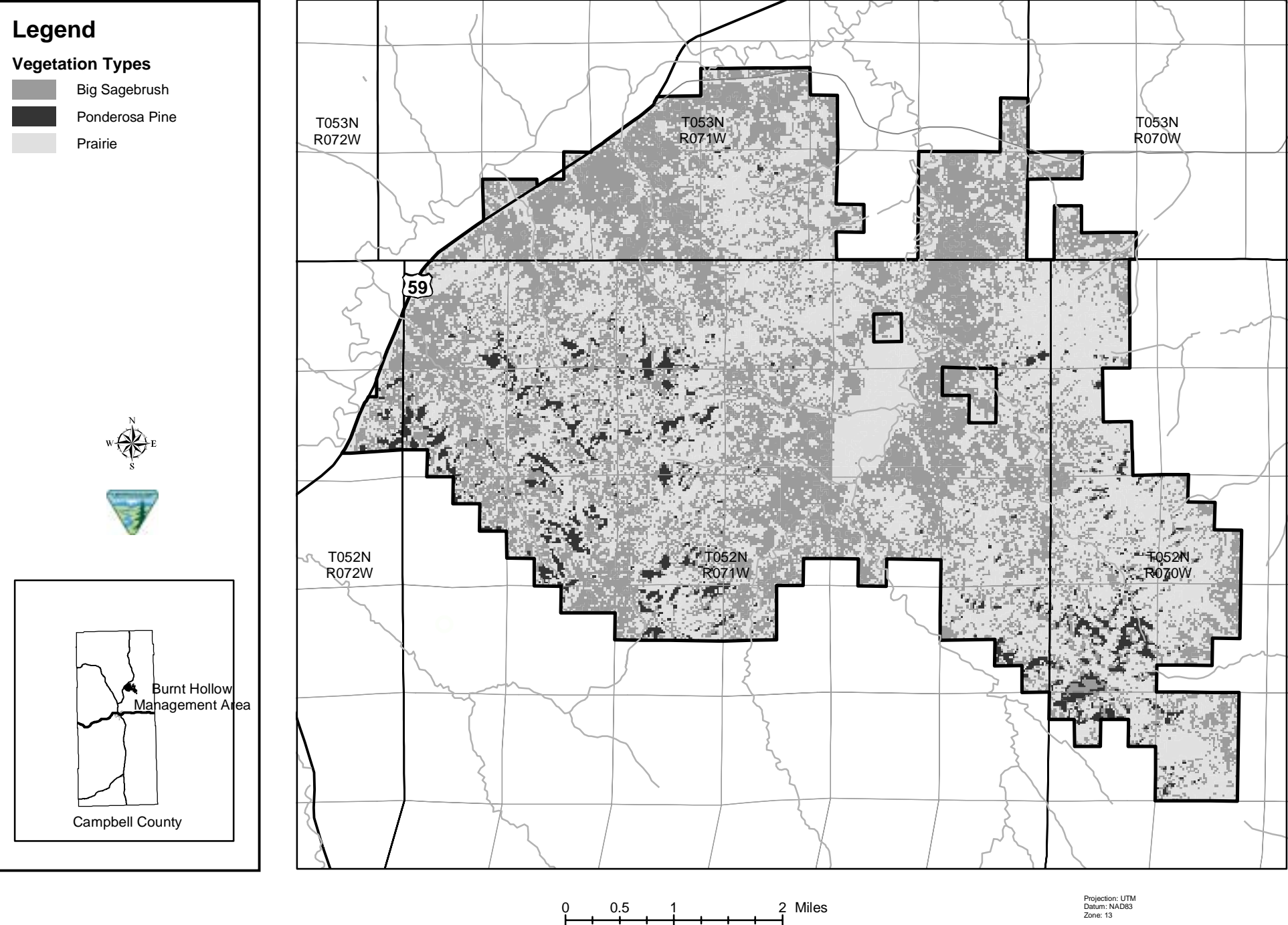
* Includes some area outside of the grazing allotment.

Much of the area adjacent to Cow Creek has been seeded to pasture grasses, resulting in the early seral rating. Cow Creek does not support the native species that would typically be found along an intermittent stream. The other area of early seral stage is a small parcel in the southwest corner that burned in a wildfire.

3.9 Water Resources

There are approximately 70 miles of intermittent streams within the BHMA. Cedar Draw, Cow Creek, Hells Canyon Draw, and Provant Creek are the primary drainages. These streams support plains cottonwoods along segments of their banks. The drainages have been rated as non-functional in part due to lack of bank stabilizing vegetation (sedges, rushes, and willows), juniper encroachment, and lack of cottonwood regeneration. The streams flow northward to the Little Powder River. There are several springs which support wetland vegetation. Nine water wells and several small reservoirs

Figure 3.3 Vegetation Communities within the Burnt Hollow Management Area, Campbell County, Wyoming.



have been developed for livestock watering.

3.10 Wildlife

The BHMA contains a mosaic of prairie (52%), shrublands (42%), and forest (4%) habitats supporting a diversity of wildlife species. Forest cover is predominant on the hilltops and extending down the drainages. Shrublands are interspersed with prairie habitats on the slopes and at the lower elevations. Many of these vegetation types are in older successional stages. The drainages have been rated as non-functional in part due to lack of bank stabilizing vegetation (sedges, rushes, and willows), juniper encroachment, and lack of cottonwood regeneration. Juniper, ponderosa pine, and sagebrush density are higher than was likely the prehistoric average.

Mule deer (*Odocoileus hemionus*) is the most common big game species within the BHMA while white-tailed deer (*O. virginianus*), American pronghorn (*Antilocapra americana*), and elk (*Cervus elaphus*) are also present. Mule deer utilize all habitats within the BHMA. Historically, the mule deer harvest was tightly controlled resulting in trophy class mule deer bucks. White-tailed deer and pronghorn primarily utilize the low elevation habitats, and are uncommon within the forest areas. A small population of elk inhabits the Little Powder River watershed including the BHMA. Common game birds include greater sage grouse (*Centrocercus urophasianus*) and wild turkey (*Meleagris gallopavo*). Wild turkeys utilize the forest, shrubland and grass/prairie habitats, while sage grouse reside primarily within the sagebrush and grassland habitats. Two sage grouse leks have been documented in the BHMA vicinity, Saddlesore located south of the Cow Creek County Road and Wallace to the southeast of the Cow Creek Breaks area. Saddlesore is an active lek, while the status of Wallace is unknown.

Sensitive species potentially inhabiting the prairie grasslands include Baird's sparrow (*Ammodramus bairdii*), burrowing owl (*Athene cunicularia*), ferruginous hawk (*Buteo regalis*), long-billed curlew (*Numenius americanus*), and swift fox (*Vulpes velox*). Shrubland habitats may support the following sensitive species: Brewer's sparrow (*Spizella breweri*), burrowing owl, ferruginous hawk, greater sage grouse, loggerhead shrike (*Lanius ludovicianus*), sage sparrow (*Amphispiza billneata*), sage thrasher (*Oreoscoptes montanus*). The ponderosa pine/juniper forest may support the sensitive species northern goshawk (*Accipiter gentiles*).

The Wyoming Natural Diversity Database (WYNDD) contains records of three BLM sensitive species in the Little Powder River watershed; the species are burrowing owl, greater sage grouse, and northern leopard frog. Sage grouse droppings have been identified within the BHMA. Leopard frogs have been documented within stock reservoirs in the BHMA. The BLM database has documented raptor nests, bald eagle winter roosts, black-tailed prairie dog colonies, and greater sage grouse leks within the Little Powder River watershed, however none occur within the BHMA.

Threatened, endangered, and proposed species possibly occurring within the Little Powder River watershed include the bald eagle (*Haliaeetus leucocephalus*), black-footed ferret (*Mustela nigripes*), mountain plover (*Chardrius montanus*), and Ute ladies'-tresses

orchid (*Spiranthes diluvialis*). The WYNDD and BLM databases do not contain any observations for any of these species within the BHMA.

Cottonwoods and ponderosa pines within the BHMA are capable of supporting nesting or roosting bald eagles, however a reliable prey base is not present. The Little Powder River does not sustain a reliable fishery and often does not flow year-round. Cattle are the primary livestock class grazed within and surrounding the BHMA; roost sites within the Powder River Basin have often been associated with large sheep herds (Anderson and Patterson 1988). There are no prairie dog colonies within the BHMA to support black-footed ferrets. The drainages within the BHMA are all ephemeral and do not provide Ute ladies'-tresses habitat. A WYNDD (2003) potential distribution model also indicates Ute ladies'-tresses orchid habitat would be unlikely within the BHMA, potential range is limited to the southern third of Campbell County.

There is potential nesting habitat for mountain plovers within the prairie communities that consist of sparse/dry grasslands and the sagebrush communities which have low shrub densities. Where these vegetation types and areas of low slope coincide are primarily along the drainages.

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

This section describes the scientific and analytical comparison of the effects (environmental consequences) that would result from implementation of the proposed action and alternatives. An environmental effect or consequence is defined as a modification or change in the existing environment brought about by the action taken. Effects can be direct, indirect, or cumulative and can be temporary or permanent. Effects can vary in degree, ranging from only a slight change to a drastic change in the environment. The focus is on effects that may influence decisions about the proposed action and alternatives, rather than a laundry list of every conceivable environmental effect.

Some of the proposed actions require additional project or site-specific planning to determine actual on-the-ground detail; consequently, separate environmental analysis documents will be prepared to analyze these actions as project plans are developed.

Effects on Critical Elements of the Human Environment

The environmental consequences to critical elements of the human environment are summarized in Table 4.1.

Table 4.1. Summary of effects to critical elements of the human environment.

Critical Element of Human Environment	Present in BHMA	Affected by Alt. 1	Affected by Alt. 2	Affected by Alt. 3	Affected by Alt. 4
Air Quality	Yes	Yes	Yes	Yes	Yes
Area of Critical Environmental Concern	No	No	No	Yes	No
Cultural Resources	Yes	Yes	Yes	Yes	Yes
Environmental Justice	No	NA	NA	NA	NA
Farm Lands (Prime/Unique)	No	NA	NA	NA	NA
Flood Plains	Yes	Yes	Yes	Yes	Yes
Native American Religious Concerns	No	NA	NA	NA	NA
Noxious Weeds	Yes	Yes	Yes	Yes	Yes
Threatened and Endangered Species	Yes	Yes	Yes	Yes	Yes
Wastes; Hazardous or Solid	No	NA	NA	NA	NA
Water Quality; Drinking/Ground	Yes	Yes	Yes	Yes	Yes
Wetlands/Riparian Zones	Yes	Yes	Yes	Yes	Yes
Wild and Scenic Rivers	No	NA	NA	NA	NA
Wilderness	No	NA	NA	NA	NA

TABLE 4.2 Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Air Quality				
Mineral Development	Emissions and road dust likely, effects would be considered during site-specific analysis.	Same as Alternative 1.	Effects similar but less than Alternative 1. Minerals management plan may include measures to protect air quality.	
Recreation	Emissions and road dust from motor vehicles would increase.	Effects would be least, as motor vehicle use is restricted to administrative and emergency use only.	Effects similar to Alternative 1 but less due to seasonal motor vehicle restrictions.	Greatest effects due to greatest opportunity for motor vehicle use and recreation facility development.
Vegetation Management	Management activities likely to affect air quality. Effects would be considered during project planning.	An active management program would have the greatest effects on air quality. Effects would be considered during project planning.	Without active management mostly no effect, however a large wildfire is likely to produce large short-term impacts.	
Cultural/Historical				
Livestock Grazing	Artifacts may be uncovered and damaged.	Same as Alternative 1.	No effect	

TABLE 4.2 Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Mineral Development	Artifacts are likely to be uncovered and destroyed by mineral activities. Cultural resources would be considered during analysis of minerals proposals.	Same as Alternative 1.	Minerals management plan may increase protection of cultural resources. Otherwise similar to Alternative 1.	
Recreation	Artifacts may be vandalized or removed by recreationists. Vehicle use may uncover and damage cultural resources.	Less than Alternative 1 as motorized recreation is prohibited and developed facilities limited. Primary effect would be vandalism and theft.	Similar types of effects as Alternative 1, but at slightly greater level. Development of recreation facilities may uncover and damage artifacts.	Greatest effects to cultural resources. Most recreation facility development and motorized recreation.
Vegetation Management	Artifacts are likely to be uncovered and damaged by vegetation management activities. Cultural inventories shall be performed prior to management activities.	Higher likelihood of damage to cultural resources than Alternative 1. An active vegetation management program is proposed. Cultural inventories shall be performed prior to management activities.	With the absence of vegetation management activities cultural resources should not be damaged. The risk of catastrophic wildfire is increased, artifacts maybe damaged during a large fire.	

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Livestock Grazing				
Mineral Development	Development would reduce forage availability by removing vegetation and displacing livestock. Livestock grazing would be considered during analysis of minerals proposals.	Same as Alternative 1.	Minerals management plan may increase protection of livestock resources. Otherwise similar to Alternative 1.	
Recreation	Recreationists and motor vehicles may harass and displace livestock. A slight decrease in forage availability is likely from vegetation trampling and competition from recreation stock.	Similar effects, but less than Alternative 1 as motorized recreation is prohibited and developed facilities are limited.	Similar types of effects as Alternative 1, but at slightly greater level. Development of recreation facilities may reduce available forage.	Greatest effects to livestock resources. Most recreation facility development and motorized recreation.
Vegetation Management	Management activities may displace livestock and modify forage availability. Forest and shrubland treatments are likely to increase forage production.	Likely to have the greatest short-term impacts on livestock grazing and the greatest long-term benefits. Goal is to maintain historical range of variability.	Vegetation will continue to age, declining in productivity and palatability. Available forage will decrease over time.	

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Minerals				
Recreation	Recreationists may utilize roads developed for minerals possibly interfering with mineral activities. Vandalism of facilities is possible.	Motor vehicle use by recreationists is prohibited. Use and vandalism of mineral facilities is likely to less than in Alternative 1.	Special management designation will be evaluated, which may lead to restrictions on mineral development. Otherwise similar to Alternative 1.	Same as Alternative 1.
Recreation				
Livestock Grazing	Livestock presence may reduce satisfaction levels. Interior fences may lead to confusion on boundaries. Livestock provide trails and some users enjoy seeing livestock.	Same as Alternative 1.	Lack of livestock may increase recreation satisfaction levels for some users while decrease satisfaction for users seeking the “western” atmosphere.	
Mineral Development	Development would likely decrease satisfaction levels. New roads may provide additional recreational opportunities. Mineral development may provide financial resources for recreational facility development.	Same as Alternative 1.	Effects similar to Alternative 1 but likely to be less as minerals management plan may place additional restrictions on mineral development.	

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Recreation	User conflicts between motorized and non-motorized recreationists. No developed facilities provided. Those seeking developed facilities and those seeking solitude may be disappointed.	Non-motorized recreationists likely to be satisfied, motorized recreationists would not be. Primitive character of area maintained. Those seeking developed facilities would not be satisfied.	Limited motor vehicle use, conflicts between user groups should be decreased. Facilities or opportunities provided for all user groups.	Those seeking developed facilities or motorized recreation would be most satisfied. Those seeking primitive conditions would be dissatisfied.
Vegetation	Some users likely to be dissatisfied with level of fire suppression efforts. Other vegetation management activities, likely to be at a low level, but would likely to detract from the recreation experience.	An active vegetation management program is may detract from the recreation experience. If used as an educational opportunity, may add to appeal of some users.	The lack of active vegetation management would not detract from the recreation experience. Risk of wildfire would increase; a large wildfire would likely detract from the recreation experience.	
Wildlife	No active management which would influence population levels, little effect on recreation.	Habitat enhancements should increase wildlife population levels and enhance the recreation experience.	Same as Alternative 2.	

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Social/Economic				
Livestock	Continued grazing would provide positive social and economic effects.	Same as Alternative 1.	Prohibition of livestock grazing would negatively effect economic resources.	
Minerals	Mineral activities would provide economic stimulus.	Same as Alternative 1.	Effects may be slightly less than Alternative 1 if the minerals management plan contains requirements which limits or deters development.	
Recreation	Recreation opportunities would provide positive social/economic effects.	Similar effects as Alternative 1. Possibly slightly less positive effects due to limited motor vehicle use.	Similar to Alternative 1.	Effects similar to Alternative 1. Possibly slightly greater positive economic effects due to greater developed and motorized recreation opportunities.
Vegetation Management	The limited vegetation management activities would provide some economic and social benefit	An active vegetation management program is likely to provide social/economic benefits to the community.	No economic effects.	

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Soils				
Livestock	Hoof action may result in localized soil erosion and soil compaction. In other areas hoof action can have a positive affect on water infiltration and nutrient cycling.	Same as Alternative 1.	Prohibition of livestock grazing would not increase soil erosion or compaction. Beneficial soil effects would also not be realized.	
Minerals	Mineral development would result in localized soil erosion and compaction.	Similar to Alternative 1.	Minerals management plan would likely provide additional measures to protect soil resources.	
Recreation	Soil erosion and compaction likely in areas traveled by motor vehicles or heavy non-motorized use.	Effects similar to Alternative 1, but less due to prohibition on recreational motor vehicle use.	Similar to Alternative 1. Developed facilities likely to increase localized soil compaction, hardening should reduce erosion. Seasonal motor vehicle restrictions should protect fragile soils.	Types of effects similar to Alternative 1. Overall effects would be greater due to developed facilities which may compact soils, hardening should reduce erosion.

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Vegetation Management	Removing vegetative cover is likely to increase soil erosion until vegetation becomes re-established.	An active vegetation management program would have greater effects than Alternative 1.	Soil erosion would be reduced without vegetation treatments. Large wildfire could remove vegetation cover increasing soil erosion.	
Vegetation				
Livestock	Current grazing management may contribute to lack of riparian shrub and cottonwood regeneration. Upland vegetation should remain compatible with livestock grazing.	Proposed livestock management practices should increase vegetation health and productivity, thereby increasing forage availability. Shrub and cottonwood regeneration should be enhanced.	Shrub and cottonwood regeneration would be enhanced. Benefits of hoof action breaking vegetation mats and aerating soil would be lost. Litter may accumulate, decreasing grass production, without livestock grazing.	
Minerals Development	Vegetation would be lost as mineral facilities are developed. Prairie communities may recover fairly quickly, shrub and forest communities would require several decades to recover.	Same as Alternative 1.	Effects similar to Alternative 1, but less if minerals management plan restricts development or includes strong reclamation requirements.	

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Recreation	Localized areas of vegetation would be trampled by recreationists and their vehicles. Invasive non-native vegetation may increase. Vegetation would likely be removed for use by recreationists.	Types of effects would be similar to Alternative 1 but should be less with restrictions on motor vehicle use.	Types of effects would be similar to Alternative 1 but may be greater with developed camping facilities.	Effects to vegetation would be greatest for Alternative 4 as it authorizes the most development and motor vehicle use.
Wildlife Management	Habitat enhancements would alter vegetative communities, the goal being to increase vegetative diversity and structure.	Similar to Alternative 1.	Types of effects similar to Alternative 1. Effects are likely to be greater as there are likely to be more habitat enhancements.	
Water				
Livestock	Non-functioning condition of water resources would likely continue. Water quality would not improve.	Management activities should decrease soil erosion and increase water quality. Riparian community health and diversity should improve, as should the functioning condition of the water resources.	Prohibition of grazing may result in a faster recovery of the riparian community and water resources than Alternative 2.	

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Mineral Development	Increased levels of sedimentation, emissions, hazardous materials, and produced water are likely.	Same as Alternative 1.	Types of effects would be similar to Alternative 1 but may be less if the minerals management plan provides additional protection of water resources.	
Recreation	Camping near water, improper sanitation, and vehicles crossing streams are likely to impact water resources. Effects would increase as recreation use and motor vehicle access increases.	Types of effects same as Alternative 1, restrictions on vehicle use and lack of developed facilities should benefit water resources.	Effects would be less than Alternative 1 but greater than Alternative 2. Seasonal vehicle restrictions would provide protection for soil and water resources.	Greatest effects to water resources as it provides for the most motor vehicle use.
Vegetation Management	Sedimentation and solar radiation would increase with the removal of vegetation cover. Recruitment of woody debris would decline. Over the long-term management activities would benefit water resources.	Types of effects would be the same as Alternative 1, but the level of management activities would be greater than Alternative 1. Both the short-term negative effects and the long-term beneficial effects would be greater.	Sedimentation and solar radiation would be the least, benefiting the water resources. Water quantity would continue to decline as juniper and pine density continues to increase.	

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Wildlife				
Livestock	Riparian and stream habitat quality would likely remain static or decrease.	Riparian and stream habitat quality should increase. Improved grazing practices should provide more forage for both livestock and wildlife.	Riparian and stream habitat quality would increase. All forage would be available for wildlife.	
Mineral Development	Development would result in loss of wildlife habitat while activities would likely displace wildlife.	Same as Alternative 1.	Types of effects would be the same as Alternative 1, effects may be less if the minerals management plan includes additional restrictions for wildlife protection.	
Recreation	Wildlife would be displaced by vehicle activity.	Restrictions on motor vehicle use and facility development would benefit wildlife.	Construction of facilities would result in localized loss of habitat. Vehicle use would displace wildlife, seasonal restrictions would provide some relief.	Effects similar to Alternative 3 but greater as more development and motor vehicle use is authorized. There are no seasonal vehicle restrictions.

TABLE 4.2 (cont.) Summary of Environmental Effects on Key Resources Identified in the Burnt Hollow Management Plan.

Resource Issue	Alternative 1 No action	Alternative 2 proposed action	Alternative 3	Alternative 4
Vegetation Management	Treatments would remove wildlife habitat. Wildlife would be displaced during treatments. Early seral species may benefit.	Types of effects similar to Alternative 1. The level of short-term negative effects is likely to be great, the goal is to restore historical vegetation conditions which should benefit wildlife long-term.	Vegetation communities would continue to mature benefiting late seral species. Risk of catastrophic wildfire would increase, a large wildfire would favor early seral species.	

4.1 Effects on Air Quality

Mineral development, recreation (motorized vehicle use), and vegetation management are the activities most likely to affect air quality

Mineral Development Effects on Air Quality

Given the low level of anticipated mineral activity and good atmospheric dispersion conditions, it is not expected that mineral development would significantly deteriorate air quality under alternative 1 (no action) or alternative 2 (proposed action). Air quality would be considered when site-specific mineral development proposals are analyzed.

Alternative 3 proposes a minerals management plan to guide mineral development. Mineral development would likely impact air quality to a lesser degree than the no action alternative, as the minerals management plan would likely include measures to protect air quality.

Recreation Effects on Air Quality

Existing roads and trails would be available for vehicle use with no seasonal restrictions under alternative 1 (no action). Vehicle emissions and road dust would impair air quality, but with good atmospheric dispersion conditions motor vehicles should not be a significant effect. Effects would be less under alternative 3 (semi-motorized) which includes seasonal road closures; environmental consequences would be similar or greater under alternative 4 (developed motorized) which does not have seasonal road restrictions and includes an OHV trail. Alternative 2 (non-motorized) would benefit air quality, as motor vehicles for recreational use would be prohibited within the BHMA.

Vegetation Management Effects on Air Quality

Vegetation management activities could degrade air quality under alternative 1 (no action) and alternative 2 (historic range). Given the nature of the vegetation management activities and the good atmospheric dispersion conditions, significant effects to air quality are not anticipated. Air quality would be considered when planning vegetation management activities, and measures taken to reduce impacts. For example, prescribed fires may only be conducted under good atmospheric dispersion conditions. Vegetation management activities would reduce the risk of catastrophic wildfire; smoke and emissions from a large wildfire would impair air quality.

Alternative 3 (natural processes) would not authorize management activities such as timber harvest or prescribed fire, this would benefit air quality. However, by not allowing vegetation management activities risk of catastrophic wildfire would increase. Smoke and emissions from a large wildfire would impair air quality.

4.2 Effects on Cultural/ Historic Resources

Given the low percentages of existing inventory in BHMA, it is crucial to identify and evaluate all cultural properties which might be directly affected by development, or indirectly by use of the study area, per the management plan for the area. As developments are identified, project specific inventories will be conducted to identify and evaluate cultural resources which might be impacted. Additionally, a program of

systematic survey organized by research objectives will be undertaken. Inventory has the potential to identify sites eligible to the National Register of Historic Places, which can contribute significant information on environmental change and cultural settlement patterns.

One site eligible to the National Register has been recorded in the BHMA, and should be excavated. The Texas Trail is considered to be an eligible historic property, although the known route lies north of BHMA; trail use extended over a much wider area than the defined linear corridor, and sites relating to use of the trail might occur in the BHMA.

If data recovery operations are proposed, BLM will consult with the State Historic Preservation Officer and interested Native American groups on appropriate data recovery plans and interpretation of the results.

Native American Concerns

Any effects the proposed action might have on identified traditional cultural sites must be considered as directed by the National Historic Preservation Act, the American Indian Religious Freedom Act, PL 95-341 and the Archaeological Resources protection Act of 1979. No sites of Native American religious or cultural importance have been identified to date. Native American groups can comment, submit information, or visit the area informally or formally. If sites or localities of religious or cultural importance are identified, the information will be treated confidentially, and appropriate actions will be taken to address concerns related to those sites.

Paleontology

Ground disturbing activities will require sufficient inventory and mitigation to determine whether significant paleoresources occur in the area of the proposed action. Mitigation beyond initial findings may range from no further mitigation necessary to full and continuous monitoring of significant localities during the action. Mitigation activities can also include survey and inventory, researching regional databases and collections, spot check survey, monitoring during dirt work, and collection and analysis of specimens.

Activities most likely to affect cultural and historic resources are livestock grazing, mineral development, recreation, and vegetation management.

Livestock Grazing Effects on Cultural/Historic Resources

Alternative 1 (current management) and alternative 2 (deferred grazing) provide for livestock grazing. Effects from grazing are not expected to be significant. Hoof action may occasionally uncover buried resources and damage exposed resources. Alternative 3 (no grazing) would be beneficial to cultural and historic resources. Livestock would not be present to potentially damage sensitive resources.

Mineral Development Effects on Cultural/Historic Resources

Cultural and historic resources could be destroyed by surface disturbing activities, i.e. road or well pad construction, during mineral development. Under alternatives 1 and 2 mineral development would proceed only after site-specific proposals are analyzed,

cultural resources would be considered during the analyses. Given the low level of anticipated mineral development effects to cultural resources are not expected to be significant. Alternative 3 proposes development of a minerals management plan which could provide for increased protection of cultural resources.

Recreation Effects on Cultural/Historic Resources

Developing recreation facilities such as roads, trails, and campgrounds could damage or destroy cultural resources. Users may vandalize or steal cultural resources. Alternative 1 (no action) does not provide for additional recreation facilities, therefore cultural resources would not be impacted by facility development. The primary impact to cultural resources would be vandalism or theft by recreational users.

Alternative 2 (non-motorized) authorizes an educational facility and two trailheads to be developed; no additional roads, campgrounds or other facilities would be constructed within the BHMA interior. The education facility would require a site-specific environmental analysis, in which cultural resources would be considered. Impacts to cultural resources would likely be less than under the no action alternative due to the lack of surface disturbance from motor vehicles and facility development.

Alternative 3 (semi-motorized) would authorize recreation facility development including an education center, dispersed camp sites, trailheads, and improvements to existing roads. A cultural inventory would be performed prior to any surface disturbing activities to identify cultural resources. Projects such as camp site development and the educational facility would require site-specific environmental analysis, in which cultural resources would be considered. Impacts to cultural resources would likely be greater than under the no action alternative due to the development of recreational facilities.

Alternative 4 (developed motorized) would have the greatest effect on cultural resources as it allows for the greatest vehicle use and facility development. Projects such as campground development, ATV trail, and the educational facility would require site-specific environmental analysis, in which cultural resources would be considered.

Vegetation Management Effects on Cultural/Historic Resources

Vegetation management effects to cultural resources is expected to be similar under alternative 1 (no action) and alternative 2 (historic range). Surface disturbance from activities such as timber harvest or fire line construction could expose, damage, or destroy cultural resources. Cultural inventories will be performed prior to planned vegetation management activities which should identify and enable the protection of cultural resources.

Alternative 3 (natural processes) should have the least effect on cultural resources as vegetation management activities such as timber harvest and prescribed fire would not be authorized. Risk of catastrophic wildfire is increased, artifacts maybe damaged or destroyed during a large wildfire.

4.3 Effects on Livestock Grazing

Activities most likely to affect livestock grazing are mineral development, recreation, and vegetation management.

Mineral Development Effects on Livestock Grazing

A direct effect of mineral development is the loss of forage availability due to the construction of roads, well pads, and other infrastructure. An indirect effect is the displacement of cattle from near mineral facilities due to the activities at the facilities.

Effects are likely to be similar under Alternative 1 (no action) and Alternative 2 (proposed action). Effects to livestock grazing would be considered during the site-specific analysis of mineral proposals. Alternative 3 provides for the development of a minerals management plan which may increase protection of the livestock resources, otherwise effects are similar to Alternatives 1 and 2.

Recreation Effects on Livestock Grazing

The development of recreation facilities would result in a direct loss of available forage. Activities at these facilities may further displace cattle, thereby increasing the loss in available forage. Recreational activities outside of developments may also displace cattle, and some users may harass grazing livestock. Vegetation trampled by recreationists may also decrease forage availability. Recreation stock may compete with cattle for forage.

Effects would be least with Alternative 2 (non-motorized) as there are no developed facilities, with the exception of an education center, and the lowest level of authorized motor vehicle use. The level effects would likely increase in Alternative 1 (no action), Alternative 3 (semi-motorized), and Alternative 4 (motorized developed) respectively as the amount of development and/or motor vehicle use increases.

Vegetation Management Effects of Livestock Grazing

A direct effect of vegetation management would be the short-term loss of forage due to vegetation removal. Following treatments, forage production and palatability is likely to exceed pre-treatment levels for several years before gradually returning to pre-treatment forage levels. Alternative 1 (no action) and Alternative 2 (maintain historic range) provide for vegetative treatments. Alternative 2 proposes an active vegetation management plan which would result in the greatest short-term negative effects and greatest long-term beneficial effects. Alternative 3 (natural processes) does not propose active vegetation management, forage production is likely to gradually decrease as vegetation communities age; grass and forbs are replaced by shrub and forest cover. Risk of catastrophic fire would also increase, a large fire would initially reduce forage availability but forage production in the fire area would then likely exceed current levels for several years.

4.4 Effects on Mineral Resources

Most resource activities should not affect the mineral base. Mineral development may be influenced by other resources concerns, primarily the effects of mineral development on

the other resources. Only alternatives within the recreation resource would significantly affect mineral development authorization. Recreation alternative 3 (semi-motorized) proposes special management area (ACEC) consideration. ACEC designation may include restraints on mineral development. Alternative 1 (no action), alternative 2 (non-motorized), and alternative 4 (developed motorized) do not propose special management area consideration and would not significantly influence mineral development. Recreationists using roads developed for minerals may interfere with minerals activities, and some vandalism is likely.

4.4 Effects on Recreation and Education Resources

Livestock Grazing Effects on Recreation/Education Resources

Under Alternative 1 (no action), the present stocking rate in the BHMA would not be adjusted. The present stocking rate may influence recreational opportunities. Adverse effects may include cow litter on the trails and encounters with livestock on the trails. Rutting of recreation trails from cow use may occur if the livestock heavily use the trails, which may require an increase in trail maintenance. Recreation users may also use the network of livestock trails. Livestock may also enhance some recreation users' satisfaction due to the aesthetic appeal of grazing cattle in a rural western setting.

Existing livestock fences within the BHMA may introduce issues such as confusion of whether or not the fence is the border to private land, or the user may neglect to close gates. Under this alternative, there will be no signs informing the user of boundary locations and livestock management practices.

Other issues with the current livestock management may be livestock harassment from some users, or some livestock harassing users, and an increase of conflicts between the users and the ranchers and landowners.

With Alternative 2 (deferred rotation), the types and levels of effects would likely be similar to Alternative 1.

With Alternative 3, prohibiting livestock grazing would likely benefit recreation activity in the BHMA. The recreation users' satisfaction level may increase due to the lack of livestock presence in the area, no additional network of livestock trails, no cow litter, and no livestock damage on the existing trails. Those users seeking the western appeal of grazing cattle would likely be disappointed.

Mineral Development Effects on Recreation/Education Resources

Under alternative 1 (no action), the lands would be available for leasing and the mineral development proposals would be evaluated when received. Mineral activity may undermine the recreation users' satisfaction level due to reduced aesthetic values. Mineral extraction may pose a safety hazard to recreation users, for example hydrogen sulfide gas and other toxic or explosive materials. Other possible issues may be conflicts between operators and users, and possible vandalism to mineral extraction equipment.

Mineral development may make financial resources available for recreation facilities. For alternative 2 (proposed action), mineral development effects would be similar to those described for alternative 1. Alternative 3 provides for additional consideration of recreation resources during the development of a minerals management plan, which should reduce effects to recreation resources.

Recreation/Education Effects on Recreation/Education Resources

Alternative 1

Alternative 1 (no action) would not change the existing recreational resources; there would not be development of any campgrounds, trailheads, education facilities, or other recreational facilities. The lack of any developed sites will enhance the natural setting and will not subject the land to any surface disturbance, thus sustaining the semi-primitive integrity of the area. The lack of developed camping may also spread out recreation use throughout the BHMA instead of containing camping use to defined areas.

Without direct management action to manage for the projected public use, the environment may experience degradation in certain areas where activities are more popular and other issues such as littering, and difficulty in managing other recreation use issues.

Under the no action alternative, recreation management for the BHMA will not design or establish a sign program. Issues such as user conflicts between users and private land owners may remain unresolved. Recreation users may experience confusion over the network of fences existing within the BHMA area and where the private land parcels exist. Other issues that could be addressed by a sign program include a direct and unobtrusive approach of informing and educating the users, respect for private land boundaries, litter management, motorized vehicle management, identifying recreation opportunities, and describing BLM's role in managing the BHMA.

Without trailhead parking areas users may park along the main roads on the western (Wyoming Highway 59) and northern (Cow Creek County Road) borders, creating a safety hazard. Interior roads provide unlimited parking opportunities, which may result in exceeding the BHMA's carrying capacity during times of heavy use resulting in environmental damage and recreation experience degradation.

Under alternative 1, the existing roads and trails in the BHMA will be made available for motorized use with no seasonal restrictions. This management decision may negatively impact some recreation users' satisfaction level. User conflicts may escalate between users such as hikers and horseback riders and motorized vehicle users. A potential for an increased risk of accidents between users may ensue without any motorized vehicle management. There will be an increased environmental risk with the possible increased presence of motorized vehicle use. Soil degradation and vegetation trampling are likely in areas of high use.

Under the no action alternative, recreation monitoring will be utilized as resources are

available. Such recreation monitoring may include surveying recreation users, road counters, monitoring the existing trails, and monitoring the environmental condition of the BHMA from the effects of heightened recreation use.

The limited law enforcement presence may result in increased levels of littering, user conflicts, trespassing, unauthorized motor vehicle use, poaching, wildlife and livestock harassment, and vandalism. This issue may be especially critical along the southern border, specifically North Draw and Provant Creek. Well used 2-track roads and jeep trails exist in this area and both routes exit the southern boundary onto private lands, which may escalate conflicts between recreational users and private land owners. No roads exist on the Cow Creek area along the southern boundary, but the smooth topography enables access to private land. Conversely, the rough terrain within the Cow Creek Breaks may make it difficult to decipher where the public and the private boundaries exist, thus making access into private land almost inevitable.

The BHMA will be available for outdoor education, but no developed facilities to meet the users' needs or designated bus parking will be available. This may result in littering and surface disturbance due to the lack of a hardened parking area and littering issues due to lack of facilities that could be used to address these issues. Without educational facilities, the BHMA would remain in a semi-primitive state thus sustaining the current and natural environmental integrity, attractive for environmental education, but probably under utilized.

Special recreation permits for recreational activity such as outfitting would be permitted under the no action alternative. This will allow for economic stimulation. This will also allow more diverse recreational activity which can be enjoyed at only certain times of the year. Outfitting opportunities may also provide for higher levels of satisfaction expressed by the users who participate in outfitting activity.

Recreational firearm shooting would be permitted under the no action alternative. This activity would affect other recreation users in a negative way undermining the users' satisfaction levels by creating a hazardous environment. Other issues related to firearms use may be an increase in vandalism, littering, environmental degradation, livestock and wildlife endangerment, user conflicts, and conflicts between firearm users and private land owners.

Under the no action alternative, an Area of Critical Environmental Concern (ACEC) designation would not be pursued for the BHMA. The lack of extra management to pursue a recommendation for an ACEC should not affect the environmental quality and integrity of the BHMA. The same management procedures are applied for alternative 2, the proposed action.

Under the no action alternative, the BHMA is open for motorized access, but not for construction of any new OHV trails within the BHMA. This management decision will decrease user conflicts between OHV operators and other users, and maintain an elevated satisfaction level for recreationists who do not utilize OHVs. Possible issues for not

managing and implementing new OHV trails may be conflicts between OHV operators and other recreation users due to the limited number of trails, the possibility of OHV operators creating their own trails resulting in an increase of environmental degradation, and possible conflicts between OHV operators and recreation management by the limitation of the recreation use for certain users.

Recreational use levels are expected to be greatest during big-game hunting seasons, when the chance for user conflicts between hunters and non-hunting recreationists would be greatest.

Alternative 2

Through alternative 2 (non-motorized), ownership issues will be addressed through a sign program. This will include maps at the two established trailhead parking areas; the maps shall delineate the BHMA and surrounding private lands ownership, reminding users to respect private land property which surrounds the BHMA, and to respect the BHMA land as well. Through a sign program, social conditions such as user conflicts between users and private land owners may be resolved. Confusion expressed by recreation users over the network of fences existing within the BHMA area and where the private land parcels exist may be addressed and eliminated. Other issues that could be addressed by the signage program may be a direct and unobtrusive approach of informing and educating the users of the benefits by respecting the BHMA by observing private land boundaries, littering laws, management action towards motorized vehicles, available recreation trails, and BLM's role in managing the BHMA.

Establishing two trailhead parking areas, in Cedar Draw and at Windmill, and an education facility will help maintain the environmental integrity. Hardening developed areas will provide specific sites that can withstand increased use, while allowing more sensitive areas to be protected. The trailheads may address issues such as carrying capacity, behavior management, littering issues, motorized vehicle control, parking control, education, and recreation monitoring from management (surveys, etc). Implementing two separate trailheads will protect the environmental integrity of the entire area, but will result in site specific surface disturbance. Other issues may be vandalism, littering, and maintenance costs. The proposed action will include inventorying the existing recreation resources, which will enable hardening specific sites of high value or interest and reclamation of damaged or sensitive areas.

If the trailhead parking areas fill, recreationists are likely to park along the main roads bordering the western (Wyoming Highway 59) and the northern (Cow Creek Road) borders allowing for an increased risk in accidents. The excess parking may also result in exceeding the BHMA's carrying capacity during times of heavy use due to management difficulties in dictating the number of users, resulting in environmental and social degradation.

Prohibiting motor vehicle access would reduce conflicts between user groups, by eliminating the motorized recreation users. Motorized recreationists would be required to utilize other areas such as the Weston Hills Recreation Area and the Thunder Basin

National Grasslands. Allowing no motor vehicle access, and not allowing for any new OHV trails will ensure a semi-primitive management level for the BHMA. This alternative may also negatively affect users who utilize OHVs as part of their recreational enjoyment. Other possible conflicts for not allowing OHV use may be conflicts between OHV operators and recreation management (BLM), or possible legal actions against management for not implementing a multiple use management plan for the BHMA.

Under the proposed action, recreation use will be monitored by any available resources and by a campground host or volunteers. The monitoring work and methods will be the same as the no action alternative.

Under the proposed alternative, a cooperative agreement with the Campbell County Sheriff and the use of a volunteer manager will be pursued. The presence of any authority may aid in controlling users behaviors and eliminate conflicts. Some recreation users may find that they are reassured and feel safer with the presence of an authoritative figure, whether it be a law enforcement officer, or a volunteer. Other users may find that the presence of any law enforcement is degrading or obtrusive.

Under the proposed alternative, a developed educational facility will be implemented. This action will create a method for raising environmental and social awareness by educating the users about the importance of respecting the BHMA and the surrounding lands. The education facility will result in site specific surface disturbance. An education facility should be beneficial to managing and sustaining the BHMA's environmental integrity. However, construction of these facilities will result in site specific surface disturbance. Other issues may include facility maintenance costs, and possibly property vandalism.

Special Recreation Permits, such as outfitting permits, managed under the proposed action will maintain the same procedures used prior to the land exchange thus maintaining both social and environmental integrity of the BHMA. Special recreation permits provide economic stimulation. This will also allow more diverse recreational activity which can be enjoyed at only certain times of the year. Outfitting opportunities may also provide for higher levels of satisfaction expressed by the users who participate in outfitting activity.

The management decision to limit firearm shooting to hunting may positively affect most of the recreation users' satisfaction level by reducing a hazardous environment. Other users may be frustrated with the decision to prohibit firearm target shooting, introducing the possibility of negative impacts such as vandalism. Other issues such as vandalism, littering issues, environmental degradation, possible livestock and wildlife endangerment, user conflicts, and conflicts between firearm users and private land should be reduced.

The proposed management should not impair ACEC suitability, trailheads would be located along the management area boundaries. An education facility would be the only development potentially impairing ACEC suitability, this issue shall be addressed when a site-specific plan for the education facility is developed. Alternative 2 does not propose

special management designation.

Alternative 3

Alternative 3 provides for limited motorized vehicle use, trailheads, including a third trailhead, are moved in from the management area boundaries, existing roads are seasonally available for motorized use, and dispersed campsites shall be developed along the Cedar Draw Road. Opening the area to additional uses, may increase conflict between recreation user groups. Motor vehicles will likely increase environmental effects such as vegetation damage, soil erosion, and air quality impacts.

Evaluation for ACEC eligibility would not affect the environmental quality. Managing to maintain an ACEC will enhance the environmental integrity of the area. Possible issues may be users who do not respect special regulations pertaining to an ACEC, such as if OHV use is prohibited.

Developing the 10 dispersed sites along Cedar Draw should not significantly degrade the environmental quality of the BHMA. Possible issues may be site specific surface disturbance due to developing the camping sites, and the increase of surface disturbance as a result of focusing camping at the specific sites. However, hardening the BHMA will result in directing recreation impacts to durable sites that can withstand an increase of use, and allow for more sensitive areas to maintain environmental quality and integrity.

In all other aspects, effects to the recreation resources are similar to alternative 2.

Alternative 4

Recreational effects would be greatest under alternative 4, which provides for the greatest level of development and motor vehicle uses. Motor vehicles would be restricted to existing roads as in alternative 3, however, soil erosion, other environmental degradation, and a possibility of increased conflicts between users and OHV operators is likely to be greater as there would not be seasonal restrictions. In addition, an OHV trail would be developed. OHV use would be restricted to the trail, in order to minimize environmental damage. Recreational firearm use is likely to result in litter, vandalism, and vegetation damage. Other effects would be similar to those discussed in alternative 2.

Vegetation Management Effects on Recreation/Education Resources

Under the no action alternative (alternative 1), the fire suppression activities will be managed according to current agreements. Possible vegetation management issues that may conflict with recreational users include a low satisfaction level due to poor aesthetic values from the vegetation management activities practiced, i.e. burned vegetation, skid trails, fire lines, etc. Fire lines created from fire suppression activities may create new recreation opportunities. Issues conflicting with vegetation management by recreational activities may include recreation users hampering weed suppression activities by unknowingly introducing weeds to the area.

Vegetation management alternative 2 (proposed action) should reduce unsightly and environmentally damaging bull dozer suppression lines through a fire management plan

emphasizing fire's ecological role and regulating heavy equipment use. Vegetation management activities are likely to be more frequent than under the no action alternative, possibly creating more unsightly treatment areas. An active educational program could interpret the objectives in restoring vegetation communities within their historic range of composition and structure.

Vegetation management alternative 3 (natural processes) should have the least effect on the recreation resources. Vegetation treatments would not be proposed, succession would be allowed to proceed uninterrupted. Fire suppression use of heavy equipment would be limited to protection of human life, eliminating unsightly dozer lines and their environmental effects. However, without planned vegetation treatments, fuel loads and the risk of catastrophic wildfire will continue to increase. The resulting fire may likely consume a larger area, having greater recreational effects, than if an active vegetation management program were initiated.

Wildlife Effects on the Recreation/Education Resources

Effects from wildlife management activities should not vary much between any alternative. The primary difference between wildlife alternatives is alternative 2 (proposed action) places slightly greater emphasis on mule deer and predator management than the other alternatives. Recreationists that enjoy mule deer and predator hunting would likely favor alternative 2. Mule deer management would emphasize habitat enhancements; harvest management is a responsibility of the Wyoming Game and Fish Department and beyond the scope of BLM's management authority. Therefore it is unlikely the mule deer hunting opportunities would be significantly different under wildlife management alternative 2 than alternatives 1 or 3.

Opportunities for predator hunting are not greater in wildlife management alternative 2; however, implementation of alternative 2 may make predator hunters more aware of the BHMA availability to recreational hunting.

4.5 Effects on Social Economic Resources

Resource activities having effects on social economic resources are livestock grazing, minerals, recreation, and vegetation management.

Livestock Grazing Effects on Social Economic Resources

Livestock grazing alternative 1 (no action) and alternative 2 (deferred rotation) propose continued livestock grazing within the BHMA which would benefit the local economy. With alternative 3 (no grazing), more than 6 miles of fence would need to be built and maintained if the lease was not issued and livestock grazing was not permitted on the public land. A current estimate of fence construction is \$32,000.00 and maintenance costs are estimated at 5% of the fence cost, or \$1,600.00 annually: The grazing operator would have to either spend over \$24,000 per year to replace the forage provided by the public lands or cull a portion of the herd. The projected herd loss has an economic value of approximately \$60,000.00.

Mineral Development Effects on Social Economic Resources

Mineral development would result in direct positive effects to the local economy. With alternatives 1 and 2 site-specific mineral projects would be analyzed when proposed. Alternative 3 proposes a minerals management plan, if the plan were to discourage mineral development, economic benefits may be lost.

Recreation Effects on Social Economic Resources

All recreation alternatives would have a positive effect on social resources, as the BHMA provides social and recreational opportunities. Limited employment opportunities may also be available through special recreation permits (all alternatives), a developed educational facility (alternatives 2, 3, 4), and a volunteer manager (alternatives 2, 3, 4). Many of the specific projects such as campground construction (alternatives 3, 4), would be contracted providing benefit to the local economy.

Vegetation Management Effects on Social Economic Resources

Vegetation management activities (alternatives 1, 2) would be contracted providing benefit to the local economy. Vegetation management alternative 3 proposes to allow natural processes, succession, to proceed without interference, and would not provide economic benefits.

4.6 Effects on Soil Resources

Resources affecting the soil resources include livestock grazing, minerals, recreation, and vegetation management. Livestock grazing proposed in alternative 1 (no action) and alternative 2 (deferred rotation) may result in localized soil erosion and soil compaction. Livestock grazing may also benefit soil resources by increasing soil aeration, breaking down soil crusts and plant litter, and promoting nutrient cycling. These effects would be less in alternative 3 which would prohibit livestock grazing.

Mineral development activities would likely result in localized soil compaction and soil erosion. Any mineral development proposal would be analyzed for environmental effects, alternatives 1 and 2. Alternative 3 (mineral management plan) would result in the least environmental impacts as the minerals management plan would likely include measures to protect soil resources, such as prohibiting minerals development in areas of fragile soils.

Recreation use is also likely to result in localized soil compaction and soil erosion. Effects are expected to increase with increasing development and motor vehicle use; degree of effects should be least with alternative 1 (no action), followed by alternative 2 (non-motorized), alternative 3 (semi-motorized), and greatest with alternative 4 (motorized).

Removing vegetation cover likely to elevate soil erosion until the vegetation cover is restored. Management activities designed to promote native riparian vegetation such as cottonwoods, willows, sedges, and rushes are likely to stabilize stream banks and decrease soil erosion potential. Alternative 2 (maintain historic range) is likely to have

the greatest short-term negative effects on soil resources and the greatest long-term beneficial effects. Effects with alternative 1 (no action) would be of similar types but to a lesser degree, although vegetation management is authorized an active management program would not be pursued. Alternative 3 (natural processes) does not provide for a vegetation management program, the beneficial effects of a vegetation management program would not be realized.

4.7 Effects on Vegetation Resources

Livestock Grazing Effects on Vegetation Resources

Livestock management, minerals development, recreation, and wildlife management resources will all affect the vegetation resources. Livestock grazing may result in localized areas of vegetation damage such as reduced tree and shrub regeneration, reduced plant vigor, reduced native floral biodiversity, and increased weed infestations. Grazing would also produce beneficial vegetation effects by breaking soil crusts and vegetation mats, preparing seed beds, providing for nutrient cycling, etc.

The BHMA has been grazed by cattle for over 100 years. Currently there are no areas where vegetation damage due to livestock is significant as determined by the Ecological Site Inventory. The area along Cow Creek was seeded to pasture grasses and is in an early ecological condition. Cottonwood and shrub recruitment along Cow Creek and other drainages is low, livestock grazing is likely one of several contributing factors. In Alternative 1 the ecological condition and trend will not change significantly since no major changes in management are proposed. Alternative 2 would improve the ecological condition through implementation of the deferred grazing schedule and range improvements.

Elimination of livestock grazing (alternative 3) would result in an increase in standing herbaceous vegetation and accumulation of plant litter (dead plant material). The increased soil cover and a reduction in soil compaction from livestock should result in a slight decrease in soil erosion. Following elimination of grazing, ecological range condition would move toward the potential natural community over the short term. Over the long term, removal of livestock grazing may result in a decrease in plant diversity and production as dead plant material increases and nutrient cycling decreases. The increase in plant material would support a return of natural wildfire intervals on the site.

Mineral Development Effects on Vegetation Resources

The construction of roads, well pads, pipe lines, and other facilities associated with mineral development would require vegetation removal. Grass and forbs should successfully recover with proper reclamation techniques, recovery of tree and shrub vegetation would take several decades. Areas disturbed for mineral development provide suitable habitat for invasive non-native vegetation. Dust associated with mineral activities may also effect vegetation near mineral facilities. Any mineral development proposal would require a site-specific environmental analysis, including effects to vegetation. Alternative 1 (no action) and alternative 2 (proposed action) would likely result in the greatest effects to vegetation resources, while alternative 3 (mineral

management plan) should have the least effects to the vegetation.

Recreation Effects on Vegetation Resources

Recreation activities such as camping, hiking, motor vehicle use, etc. would have direct, indirect, and cumulative impacts to the vegetation resources. Recreationists are likely to trample vegetation; vegetation would likely recover with light use levels, but as recreation levels increase the vegetation's ability to recover would decrease. Trampling and soil compaction would also result in an increase in non-native vegetation. Campers are likely to remove logs, snags, and some live vegetation for campfire use. Effects to the vegetation resources are likely to increase as the level of development and motorized use increases. Vegetation effects are likely to be the least with alternative 1 (no action), greater with alternative 2 (non-motorized), greater with alternative 3 (semi-motorized) and greatest with alternative 4 (motorized).

Wildlife Management Effects on Vegetation Resources

Wildlife habitat management will have direct, indirect, and cumulative effects on the vegetation resources. All three wildlife management alternatives seek to improve habitat quality and biodiversity, and would include vegetation treatments designed to increase age class and structural diversity of native plant communities. Wildlife management activities should provide for healthier vegetation resources. Vegetation management activities are likely to be greatest with wildlife management alternative 3 and least with wildlife management alternative 1 (no action). Vegetation effects from wildlife management alternative 2 (proposed action) would lay in between.

4.8 Effects on Water Resources

Livestock grazing, mineral development, recreation use, and vegetation management have direct, indirect, and cumulative effects on the water resources.

Livestock Grazing Effects on Water Resources

Unmodified livestock grazing under alternative 1 (no action) may likely continue the non-functioning condition of the water resources due to the lack of bank stabilizing vegetation. Without bank stabilizing vegetation, annual "flash" run-off of snowmelt and thunderstorms would continue to erode bank soils increase headcuts, and increase sedimentation rates to the Little Powder River drainage. Water quality would degrade, affecting downstream aquatic species.

Alternative 2 (deferred rotation) proposes management practices would be undertaken to improve the functioning condition on all drainages within the BHMA. The objective would be to have all streams classified as functional at risk or better within a 10 year period. Livestock management practices such as herding, fencing, rest periods, salting, and water developments may be employed to improve the water resources. These practices should allow cottonwoods along with other woody plants and grasses to regenerate protecting stream banks, filtering sedimentation, and improving the functioning condition of the streams and riparian habitat.

Alternative 3 (no grazing) would provide the greatest benefit for the water resources. Without livestock grazing, cottonwoods along with other woody plants and grasses should recover protecting stream banks, filtering sedimentation, and improving the functioning condition of the streams and riparian habitat.

Mineral Development Effects on Water Resources

Effects from mineral development include increased sedimentation, emissions, hazardous material spills, and produced water disposal. These effects are expected to be greatest with alternative 1 (no action), similar with alternative 2 (proposed action), and least with alternative 3 (minerals management plan). No mineral activities will be permitted within 500 feet of any spring, reservoir, water well, or perennial stream (BLM 2001). A minerals management plan would include measures to protect water resources. Any minerals development proposal would require site-specific environmental analysis, under all alternatives, providing for an evaluation of and protection of water resources.

Recreation Effects on Water Resources

Effects to water resources from recreation are expected to increase as the number of users increases with authorized levels of development and motorized use. Poor camping techniques, such as camping too close to water and improper waste disposal, may degrade water resources. Developed campsites (alternative 3) and campground (alternative 4) provide hardened camping areas, which should reduce impacts to stream resources. Camp sites would be provided away from streams, and outhouses would be provided to reduce human wastes. Vehicles crossing streams and road borne dust will likely increase sedimentation levels to streams. Water effects should be least with alternative 2 (non-motorized), slightly greater with alternative 3 (semi-motorized), greater with alternative 1 (no action), and greatest with alternative 4 (motorized).

Vegetation Management Effects on Water Resources

Loss of vegetative cover would negatively effect water resources by increasing sedimentation, increasing solar radiation, and decreasing woody debris. Timber harvests would not be authorized within 200 feet of live water (BLM 2001). Alternative 1 (no action) and alternative 2 (proposed action) seek to improve the vegetation resources which should produce long-term benefits for the water resources. Many vegetation management activities would result in a short-term reduction in vegetative cover, damaging water resources; but as healthy vegetation recovers so should the water resources, ultimately resulting in beneficial effects to the water resources. Alternative 1 provides for vegetation management although it does not encourage management activities; alternative 2 proposes an active management program to restore natural range of variability. Alternative 2 would include practices such as reducing juniper encroachment which should increase water flows, a beneficial effect.

Water resources would continue to deteriorate with alternative 3 (natural processes). Without an active vegetation management program, short-term negative effective effects to water resources from vegetation removal would be eliminated, however the long-term beneficial effects of vegetation treatment would also be eliminated. Ponderosa pine and juniper encroachment would continue, further decreasing water flows and available

water.

4.9 Effects on Wildlife Resources

Livestock grazing, mineral development, recreation, and vegetation management all have direct, indirect, and cumulative effects on the wildlife resources.

Livestock Grazing Effects on Wildlife Resources

All streams and riparian habitats within the BHMA have been rated as non-functional, in part due to the lack of bank stabilizing vegetation. With the present management (alternative 1), livestock grazing is a contributing factor to the lack of cottonwood and willow regeneration within the riparian areas. The lack of regeneration would likely continue with alternative 1. More than 80% of all wildlife species utilize riparian areas sometime in their life cycle, with non-functioning riparian habitat; there would be an expected reduction in numbers of species and periods of use.

Alternative 2 (deferred rotation) proposes that management practices would be undertaken to improve the functioning condition of all drainages and riparian areas within the BHMA. The goal would be to rate the entire riparian habitat as functional at risk or better within a 10 year period. The following are suggested livestock management actions for improving riparian habitat: herding, fencing, rest periods, salting, and water development.

Alternative 3 (no grazing) would provide the greatest benefit to the riparian habitat and greatest number of wildlife species. Riparian vegetation would recover into productive habitats supporting healthy and diverse wildlife populations. However habitat for certain species, such as mountain plovers, that benefit from livestock grazing may decline.

Mineral Development Effects on Wildlife Resources

Mineral development may have direct, indirect, and cumulative effects on the wildlife resources. Surface disturbance such as road, pipeline, and well pad construction may result in direct habitat loss. Vehicle movement, noise, and other activities will likely cause disruption and displacement of wildlife and interference in wildlife activities. Much of the displacement is expected to be short-term, during construction and drilling; it is anticipated that many wildlife species will return and resume normal behavior following the construction/drilling phase although at reduced population levels. Water produced as a consequence of mineral production may provide a limited amount of wetland/aquatic habitat for waterfowl and other wetland and aquatic wildlife species. Any proposed mineral development would undergo a detailed environmental analysis, in which effects to wildlife would be analyzed. Environmental consequences from mineral development upon wildlife would be similar in alternative 1 (no action) and alternative 2 (proposed action), and least with alternative 3 (minerals management plan).

Recreation Effects on Wildlife Resources

Construction of recreation facilities such as trailheads, campgrounds, roads, and an education facility would be a direct loss of wildlife habitat. The presence of these facilities and their associated recreation activities will likely displace wildlife from an

even greater area. Wildlife displacement is likely to increase as recreation levels increase and as motorized access increases.

Alternative 1 (no action) does not provide for recreation facility construction, there should be not be any additional direct habitat loss. Motor vehicle use will be authorized on existing roads without seasonal restrictions, resulting in displacement of wildlife from roadside habitats.

Alternative 2 (non motorized) should have the least effect on wildlife resources as recreational motor vehicle use is prohibited and recreation facility development is limited to two perimeter trailheads and an education facility.

Alternative 3 (semi-motorized) authorized three trailheads, dispersed developed campsites, and an education facility resulting in more direct habitat loss than either alternatives 1 or 2. Displacement caused by motor vehicle activity would be less than alternative 1 but greater than alternative 2. Alternative 3 provides for seasonal motorized use of existing roads.

Alternative 4 (motorized developed) would have the greatest effects on the wildlife resources as it provides for the most development and motor vehicle use. Alternative 4 includes a developed campground, OHV trail, and authorized motor vehicle use on all existing roads without seasonal restrictions.

Vegetation Management Effects on Wildlife Resources

Vegetative treatments result in direct loss of wildlife habitat. Activities associated with the treatments are also likely to displace wildlife. Displaced wildlife is expected to return following management activities to undisturbed habitats. Habitat suitability is expected to recover as the vegetation recovers. Biodiversity and species composition changes as habitat conditions change. Species favoring early seral conditions should increase as shrubland and forest cover are reduced, while late seral species should decline. As the shrub and forest vegetation returns late seral wildlife species should also.

Alternative 1 (no action) provides for vegetation management activities. Vegetation treatments are likely to favor early seral wildlife species. The level of management activities are not expected to be great with this alternative. A significant loss of habitat for late seral species is not anticipated.

Alternative 2 (proposed action) provides for an active vegetation management program. It is likely to have the greatest effects on the vegetation resources and therefore wildlife habitat and populations. The goal of this alternative is to maintain the historic vegetative conditions, with a diversity of structural and age classes. This alternative ultimately should provide for the greatest wildlife diversity.

Alternative 3 emphasizes natural processes, vegetative treatments shall not be proposed and fire suppression activities shall be limited. This alternative would favor late seral wildlife species to the detriment of early and mid seral species. Risk of catastrophic

wildfire would increase as vegetation communities age, possibly resulting in a large fire setting back the ecological process.

CHAPTER 5. LIST OF PREPARERS

Specialists from the BLM Buffalo Field Office contributed to the preparation of the Burnt Hollow Management Plan Environmental Assessment. The proposed action as described in Chapter 2 was provided by the Coordinated Resources Management Team.

Participants in the BLM interdisciplinary team and the CRM team are identified in tables 5.1 and 5.2 respectively.

Table 5.1 BLM Buffalo Field Office interdisciplinary team.

Name	Project responsibility
Thomas Bills	Project Lead, Recreation and Wildlife Resources
BJ Earle	Cultural and Mineral Resources
Larry Gerard	Recreation, Riparian, and Wildlife Resources
Steve Hannan	Vegetation Management
Kay Medders	Livestock Grazing
Paul Rau	Recreation Resources and GIS Support
Linda Reed	Mineral Resources
Brent Sobotka	Water Resources

Table 5.2 Coordinated Resources Management Team.

Name	Responsibility
Dennis Sun	Facilitator
Thomas Bills	Education, Recreation, Wildlife
David Bleizeffer	Recreation
Everett Boss	Recreation
Ester Clark	Landowner Concerns
Michelle Cook	Education
Tanya Daniels	Education
Randy Gregory	Wildlife
Roy Liedtke	Livestock
Kay Medders	Livestock
Bruce Scigliano	Recreation and Wildlife
Katie Smith	Education
Rod Smith	Livestock, Recreation, and Wildlife

Table 5.3 Technical Resource Teams.

Education	recreation
Thomas Bills	Thomas Bills
Michelle Cook	Everett Boss
Tanya Daniels	Mark Bunny
Erma Kauffman	Glen Clabaugh
Trish Kubera	Ester Clark
Connie Scigliano	John Davis
Katie Smith	Olin Oedekoven
Darla West	Red Record
Rollo Williams	Bruce Scigliano
LIVESTOCK	Rod Smith
Roy Liedtke	John Weiner
Kay Medders	Sam Wenger
Katie Smith	Sam Wenger, Jr.
Rod Smith	Bob Williams
WILDLIFE	
Thomas Bills	
Ester Clark	
John Davis	
Larry Gerard	
Randy Gregory	
Larry Heslep	
Olin Oedekoven	
Rod Smith	

CHAPTER 6. CONSULTATION

Three public meetings were held in April 1999 to solicit comments for the land exchange proposal. Sixty people attended the three meetings, and nineteen comments were received. Regional newspapers and radio stations carried stories following the public meetings. Six letters providing comments on the land exchange were received following the public meetings and media coverage. A CRM Team and four technical resource teams provided the BLM with the proposed management plan. Names and addresses of all individuals calling BLM inquiring about the BHMA were recorded. Table 6.1 includes the agencies, organizations, businesses, and individuals that attended public meetings, commented on the land exchange, participated in preparing the CRM proposal, and/or expressed an interest in the BHMA. This environmental assessment was sent to those in Table 6.1 for whom BLM had contact information.

Table 6.1 Agencies, Organizations, Businesses, and Individuals consulted.

Agencies	
Campbell County Conservation District	Sheridan County Conservation District
Campbell County Commissioners	Sheridan County Commissioners
Campbell County Planning Department	Sheridan County Planning Department
Campbell County Weed and Pest	Sheridan County Weed and Pest
Cheyenne River Sioux Tribal Council	Shoshone Tribal Council
Crow Creek Sioux Tribal Council	Thunder Basin National Grasslands
Crow Tribal Council	U.S. Fish and Wildlife Service
Flandreau Santee Sioux Executive Council	U.S. Representative: Barbara Cubin
Johnson County Commissioners	U.S. Senators: Mike Enzi & Craig Thomas
Johnson County Planning Department	Wyoming Dept. of Environmental Quality
Johnson County Weed and Pest	Wyoming Game and Fish Department
Northern Cheyenne Tribal Council	Wyoming House of Representatives
Ogalala Sioux Tribal Council	Wyoming Office of Federal Land Policy
Powder River Conservation District	Wyoming State Engineer's Office
Santee Sioux Tribal Council	Wyoming State Senate
Organizations	
Big Horn Mountain Country Coalition	Sheridan Chamber of Commerce
Boy Scouts of America	Shoshone Tribal Business Council
Buffalo Chamber of Commerce	Sierra Club, Wyoming Chapter
Gillette Chamber of Commerce	Wyoming Outdoor Council
Medicine Wheel Alliance	Wyoming Trail Riders
Northern Arapaho Business Council	Wyoming Wildlife Federation
Powder River Basin Resource Council	
Businesses	
Buffalo Bulletin	Gillette News Record
Casper Star Tribune	Sheridan Press
Individuals	
Dan Ballek	Tom Langston
Bill Barlow	Andy Lowe
John Black	Keith Luegge
Randy Blaine	Gene Mankin
David Bleizeffer	John McClelland
Everett Boss	Hal McClure
Boyd Brown	Donald McCracken, Jr.
James Carnahan	Mike Miller
Troy Carnes	Bob Molder
Mark Carter	Charles Morris
Bob Christensen	Joyce Nevins-Ginsberg
John Christensen	Scott Nicolarsen
Patricia Clark	Olin Oedekonven
Paul Coleman	Joel Ohman

Table 6.1 (continued) Agencies, Organizations, Businesses, and Individuals consulted.

Hal Corbett	Bill Peters
Ken Dellos	Virginia Purdy
Joe Dombouy	Paul Rourke
Danny Duncan	Marge Ruby
Randy Ellenson	Chris Santin
Jan Evans	Bruce Scigliano
Gerald Fink	Paul Simpson
Bill Fitch	Rod Smith
Nancy Geehan	Steve Smith
Christy Gerrits	Dave Spenser
Terri Glass	Bud Stewart
Mark Gramstad	Ron Swanson
Randy Gregory	Ed Swartz
Merv Griswold	Troy Swartz
Nadine Gross	David Tate
Duane Halverson	Douglas Wagner
Fred Hesse	Steve Washut
Neal Hilston	Carol Watkins
Roy Hovet	Sam Wenger, Jr.
Theo Hushfield	Douglas White
Peter Jacobson	Mack White
Gene Jansen	Roger Wilson
Norman Jarvis	Mark Winland
Ed Jolley	Sam Wolfe
John Jolley	John Yeager
Joe Kelleher	Carol Yoke
Kirk Koepsol	

LITERATURE CITED

- Anderson, Stanley H. and Craig T. Patterson. 1988. Characteristics of Bald Eagle Winter Roosts in Wyoming. *Prairie Nat.* 20(3):147-152.
- Bureau of Land Management. 2003. Final Environmental Impact Statement and Proposed Plan Amendment for the Powder River Oil and Gas Project. WY-070-02-065. U.S. Department of Interior, Bureau of Land Management, Buffalo Field Office.
- Bureau of Land Management. 2002. 60 Bar Fuels Reduction and Daley Fire Complex Salvage Timber Sale. WY-070-02-EA-239. U.S. Department of Interior, Bureau of Land Management, Buffalo Field Office.
- Bureau of Land Management. 2001. Approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management Buffalo Field Office. U.S. Department of Interior, Bureau of Land Management, Buffalo Field Office.
- Bureau of Land Management. 1988. National Environmental Policy Handbook. BLM Handbook H-1790-1. U.S. Department of Interior, Bureau of Land Management.
- Connelly, John W., Michael A. Schroeder, Alan R. Sands, and Clait E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. Wildl. Soc. Bull 28(4):967-985.
- Council on Environmental Quality. 1986. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. U.S. Government Printing Office. Washington, D.C. 45pp.
- Federal Register. 1982. "Wilderness Study Policy; Policies, Criteria and Guidelines for Conducting Wilderness Studies on Public Lands" Federal Register. V47(23):5098-5122.
- Wyoming Game and Fish Department. 2002. Draft Wyoming Sage-Grouse Conservation Plan. Wyoming Game and Fish Department. Cheyenne, WY.
- Wyoming Natural Diversity Database. 2003. Modeling the Potential Distribution of BLM Sensitive and USFWS Threatened and Endangered Plant Species in Wyoming. University of Wyoming, Laramie, WY.